



IGEL Zero RFX

Manual



About this Manual

All illustrations and descriptions in this manual relate to Version 5.02.100 of the IGEL Linux firmware.

This manual is divided into the following sections:

<i>Introduction</i> (page 7)	General information about the product
<i>Quick installation</i> (page 8)	Setting up the thin client for the first time
<i>Boot procedure</i> (page 11)	Boot menu, network integration, X-Server
<i>Application Launcher</i> (page 14)	Important system data such as the firmware version, list of applications, licensed services, system tools
<i>Setup application</i> (page 19)	Setting up sessions and system configuration
<i>System settings</i> (page 24)	System setting options
<i>User interface</i> (page 29)	Language, screen, entry options, font services
<i>Network</i> (page 39)	Interfaces, protocols, authentication, drives
<i>Sessions</i> (page 51)	Creating and configuring application sessions
<i>Accessories</i> (page 67)	Session accessories, card readers, sound control, Java Manager, network diagnostics
<i>Devices</i> (page 76)	Hardware, printers, storage devices, interfaces
<i>Security</i> (page 82)	Password, logging in, AD/Kerberos configuration
<i>IGEL smartcard</i> (page 83)	Company keys, saving a user/password/session, testing a card
<i>Firmware configuration</i> (page 88)	Customer-specific partition, applications, commands, start screen, environment variables, features

The following formatting is used in the document:

Hyperlink	Internal or external links
Proper names	Proper names of products, firms etc.
GUI text	Items of text from the user interface
Menu → Path	(Context) menu paths in systems and programs
Entry	Program code or system entries
Keyboard	Commands that are entered using the keyboard

Note regarding operation

Warning: Important note which must be observed

Important Information

Please note some important information before reading this documentation.

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We will then contact you as soon as possible. It will make things easier for our support staff if you provide us with all the information that is available. Please see also our notes regarding support and service information.

Please visit our *IGEL Knowledge Base* <http://edocs.igel.com> to find additional Best Practice and Howto documentation as well as the *IGEL Support FAQ*
<http://faq.igel.com/otrs-igel/public.pl?Action=PublicFAQExplorer;CategoryID=3>.

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Introduction

IGEL Thin Clients comprise the very latest hardware and an embedded operating system. Depending on the product concerned, this operating system may be based on IGEL Linux or Microsoft Windows Embedded Standard®. We have done our utmost to provide you with an excellent overall solution and promise to provide the very same level of quality service and support.

The IGEL Linux Firmware

The new IGEL zero clients for Citrix HDX, Microsoft RDS/ RemoteFX or VMware Horizon provide a genuine zero client experience at a low price yet avoid the restrictions that are typical of zero clients from other manufacturers, e.g. the lack of an update facility, management and support.

IGEL supplies specialized zero clients without compromises, i.e. optimized for one of the three leading virtualization solutions and with free support. Thanks to the Appliance Mode, the zero clients boot quickly and directly into the relevant VDI session such as Citrix XenDesktop or VMware Horizon View.

Experience "zero touch deployment" thanks to rule-based configuration during rollout. Reduce your management outlay to virtually zero thanks to profile-based, automatic remote-management of all settings. This means "zero" local management for you.

The structure of the IGEL setup is virtually identical on all zero clients and in the Universal Management Suite (UMS) management software. As a result, the configuration parameters in the local device setup can be found in the same location in the tree structure as a profile used in the management software for example. The IGEL Universal Management Suite is available to all customers on the IGEL download site. It allows management of an unlimited number of IGEL thin clients.

IGEL zero clients are future-proof. Free updates allow access to new functions if necessary. And if you decide to change the VDI solution later on, this is no problem either. With an IGEL Universal Desktop upgrade license, you can get your existing IGEL zero client hardware ready for access to other VDI solutions.

1. Quick Installation

If you follow the procedure below, you can install the thin client within your network environment in just a few minutes:

1. Connect the thin client to a monitor (VGA, DVI, DisplayPort), an AT-compatible keyboard with a PS/2 or USB connection, a USB mouse and the LAN using an RJ45 connector.
2. Connect the thin client to the power supply.
3. Start the thin client and wait until the graphical user interface has loaded.
4. Click on the **Setup** symbol in the taskbar, or launch the IGEL Setup using the key combination **Ctrl+Alt+S**.
5. Select the system language and keyboard layout under **User Interface → Language**.
6. Select the display resolution under **User Interface → Display**.
7. Enter a local IP address in the **Network** section of the setup
or retain the default DHCP mode for automatic network configuration.
8. Click on **OK** to save and apply your changes.

The device will now restart if necessary and will use the new settings thereafter.

A handy tool tip is available for virtually every setting. If you would like to know more about a setting or option, move your mouse pointer over it and wait for a moment. You can configure the tool tips under **User Interface → Screen → Desktop**.

1.1. The IGEL Linux Desktop

After the system starts, you will see the IGEL Linux desktop.



Figure 1: IGEL Linux desktop

The following components can be found in the taskbar at the bottom edge of the screen:

- Start menu (also IGEL menu)
- Quick launch bar with symbols for the Application Launcher, setup and sessions
- Info area with symbols for the volume, network, time and desktop (show/hide window)

The Start menu offers the following areas and functions:

- Application area for launching sessions
- System area for access to system programs
- Info area (About) for displaying all relevant system information
- Search for finding functions in the Start menu
- Buttons for shutting down and restarting the system

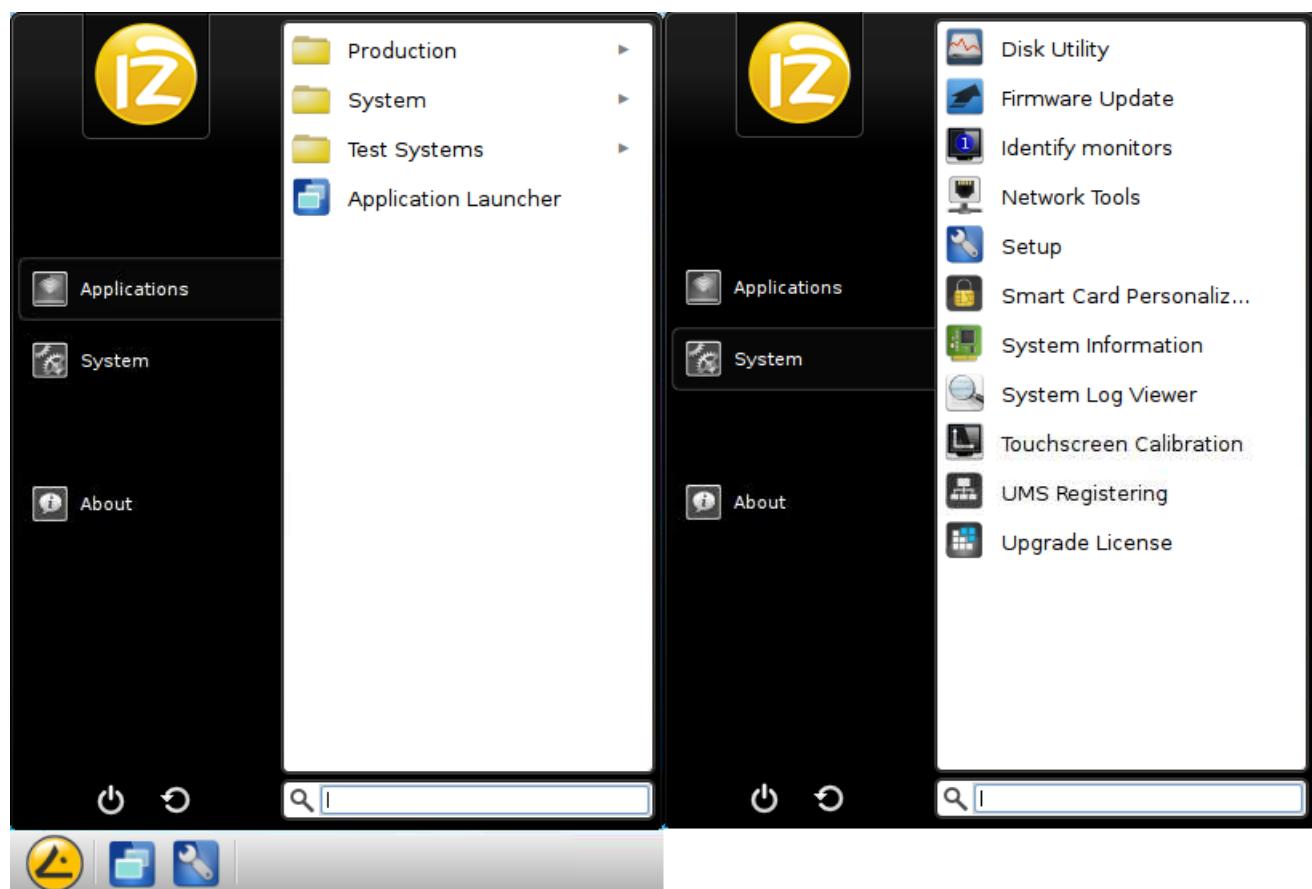


Figure 2: IGEL Start menu with application and system area

2. Boot Procedure

The quick installation procedure is complete.

- Restart the system in order to start the boot procedure.

2.1. Boot Menu

- During the boot procedure, press the **ESC** key in the **Secondstage Loader** when the **Loading Kernel** message is shown on the screen.

A menu with four boot options as well as an option for resetting the thin client to the default factory settings will appear:

Quiet Boot (page 11)	Normal boot
Verbose Boot (page 11)	Boot with system messages
Emergency Boot (page 11)	Setup only
Failsafe Boot (page 12)	With CRC check
Reset to Factory Defaults (page 12)	Resets the thin client to the default factory settings

2.1.1. Quiet Boot

Quiet Boot is the default boot mode. In this mode, all kernel messages are disabled and the graphical user interface is started.

2.1.2. Verbose Boot

Unlike in **Quiet Boot** mode, the boot messages are shown in **Verbose Boot** mode. A diagnostics shell is also available. This can be used to execute common commands (such as ifconfig etc.) when searching for and rectifying faults.

- Enter **init 3** to close this shell.

The boot procedure will then resume.

2.1.3. Emergency Boot

Emergency Boot is a setup with default parameters.

If you select **Emergency Boot**, the Secondstage Loader looks for a bootable system in the flash memory and then resumes the boot procedure as in the other boot modes.

Essentially speaking, the X-Server is started without network drivers and with a resolution of 1024 x 768 - 60 Hz during an **Emergency Boot**. The **Setup** menu is then opened directly.

This option is useful if, for example, you have selected an excessively high screen resolution or a wrong mouse type and these settings can no longer be changed in the normal setup.

2.1.4. Failsafe Boot - CRC check

During a **Failsafe Boot**, a check of the file system is carried out first. The thin client then starts in **Verbose Mode**.

2.1.5. Reset to Factory Defaults

If you select **Reset to Factory Defaults**, all personal settings on the thin client (including your password and the sessions you have configured) will be lost.

A warning message will appear on the screen before the procedure is carried out.

➤ You must then confirm your decision.

If the device is protected by an administrator password, you will be prompted to enter this password. You have three attempts to do so.

Do you not know the password?

1. When you are prompted to enter the password, press the **Enter key** three times.
2. Press **Esc** to bring up the **Terminal Key**, the individual key for the thin client.
3. Contact us using an RMA form:

[*https://www.igel.com/en/service-support/rma-request.html*](https://www.igel.com/en/service-support/rma-request.html)
[*\(https://www.igel.com/en/service-support/rma-request.html\)*](https://www.igel.com/en/service-support/rma-request.html)

4. Enter the **Terminal Key** shown, the firmware version and your contact details.

Our service department will send you a so-called Reset to Factory Defaults Key specially for your device. To ensure that the process is as straightforward and yet as secure as possible, each key is valid for just one device.

2.2. Network Integration

Is the kernel loaded?

If it is, the next step is the network configuration.

There are three possible ways of integrating the terminal into the network environment. Depending on the terminal's settings, you can choose between **DHCP**, **BOOTP** or a **manually configured IP address**.

2.3. X-Server

The final step in the boot procedure involves starting the X-Server and the local window manager.

3. Application Launcher

- To launch the tool, click on the **Application Launcher** symbol in the quick launch bar or in the Start menu.

The various Launcher sub-areas allow access to configured sessions/system programs or show information relating to licenses, the system and network connections.

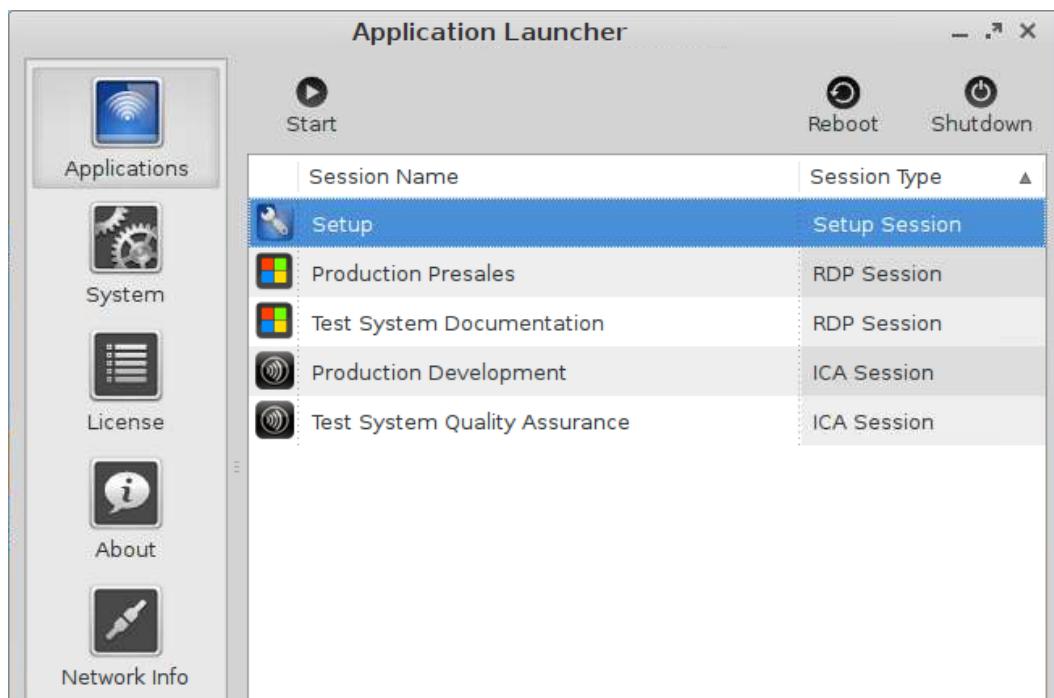


Figure 3: Application Launcher

Because the setup program is the central configuration tool for all thin client settings, a setup session is already pre-defined under **Sessions** and **System**.

Sessions (page 51)

System (page 16)

License (page 17)

About (page 15)

Network information (page 17)

Shutting down and restarting a device (page 18)

3.1. General System Information

Within the **Application Launcher** you will find the **Information** page with important system data such as the firmware version, licensed services and hardware specifications.



Figure 4: Application Launcher - system information

Details of the current network configuration with the IP address and device name are also given here.

3.2. Sessions

All sessions created are shown in a list of applications if they are enabled for the main session page.

- To open an application, double-click on it or click on **Run**.
- Alternatively, you can launch sessions via icons on the desktop, in the quick launch bar or from the Start menu and context menu.
- Applications can also be launched automatically and a key combination (hotkey) can be defined.

The available options for launching a session can be defined under **Desktop Integration** in the session configuration.

3.3. System Tools

On the System page, you can run various tools including the firmware updating tool with the pre-set update information.



Figure 5: Application Launcher - system tools

The following tools are available:

Identify monitors	Shows the screen's number and manufacturer details.
Firmware update	Carries out the update with the settings made during the setup.
Disk utility	Shows information regarding connected USB drives.
Upgrade license	Reads a new license file from the USB stick and modifies the functions of the firmware accordingly.
Network tools	Provides detailed information on the network connection and offers a number of problem analysis tools such as Ping or Traceroute.
Setup	Launches the IGEL Setup.
Smart Card personalization	Allows access data and sessions which are to be available to a smartcard user to be written to an IGEL smartcard.
System information	Shows information regarding hardware, the network and connected devices.
System log viewer	Shows system log files "live" and allows you to add your own logs.
Touchscreen calibration	Allows a connected touchscreen monitor to be calibrated.
UMS registering	Logs the thin client on to a UMS server (access data for the server are required).

3.4. License

You will find the following here:

- The licenses for the components used in the UD system
- Information on the provision of source code, e.g. under GPL

3.5. Network Information

The Network information tool allows you to read out data from your local network connections and check the availability of a UMS server:

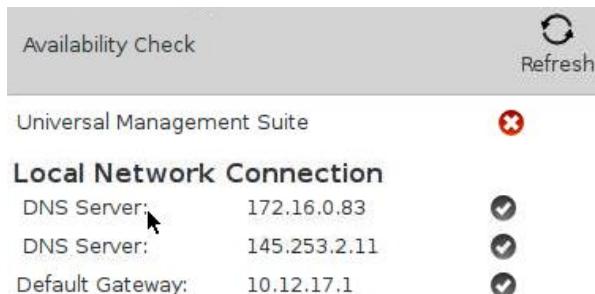


Figure 6: Network information

3.6. Shutdown and Restart

Within the **Application Launcher** you will find two buttons for starting or shutting down the device. Both actions can be disabled for the user and will then be available to the administrator only.

You can change the standard action when shutting down the device using the button on the screen or the on/off button on the device itself in the setup under **System → Energy → Shut Down**.

4. Setup Application

With the help of the setup, you can change the system configuration and session settings.

Any changes you have made in the UMS take precedence and may no longer be able to be changed. A lock symbol before a setting indicates that it cannot be changed.

Starting the setup (page 19)

Completing the setup (page 19)

Setup areas (page 19)

Setup search (page 22)

4.1. Starting the Setup

You can open the setup in the following ways:

- Double-click on **Setup** in the **Application Launcher**
or click on **Run**.
- Double-click on **Setup** on the desktop (if available based on the settings).
- Select **Setup** in the context menu on the desktop (if available based on the settings).
- Select **System→Setup** in the Start menu.
- Click on **Setup** in the quick launch bar.
- Launch the setup using the keyboard command **Ctrl+Alt+S**, or
in the Appliance mode using **Ctrl+Alt+F2**.

You can configure how the setup can be launched under **Accessories**. The options described above as well as combinations thereof are available.

4.2. Completing the Setup

The buttons **OK**, **Cancel** and **Apply** are usually available on every individual setup page.

- Click on **Apply** if you have finished configuring a setup area and would like to save your settings without closing the setup program.
- Click on **Cancel** if you have not made any changes and would like to abort the setup.
- Click on **OK** to save your changes and exit the setup.

4.3. Setup Areas

The setup application comprises the following main areas:



Figure 7: Setup areas

Sessions	Allows you to configure application sessions such as ICA, RDP, PowerTerm, browser and others
Accessories	Allows you to configure various local tools - setup pages for the local shell (Terminal), sound mixer, screen keyboard (for touchscreen monitors), options for the Application Launcher and the setup application itself.
User interface	Allows you to configure display settings, entry devices, hotkey commands etc.
Network	Allows you to configure all network settings for LAN/WLAN interfaces and the dial-up connections
Devices	Allows you to configure various devices
Security	Allows you to set the administrator/user passwords and user authorizations etc.
System	Allows you to set various basic system parameters including the date and time, information regarding the firmware update, remote management etc.

➤ Click on one of the areas to open up the relevant sub-structure.

The tree structure allows you to switch between the setup options.

Three navigation buttons are available. The buttons allow you to move back and forth between the setup pages you have visited or reach the next level up within the structure.

You will find a more detailed description of the individual setup options elsewhere. This is merely a brief overview.

4.3.1. Enable Setup Pages for Users

If a password was set up for the administrator, the IGEL Setup can only be opened with administrator rights, i.e. after entering the password (see *Password* (page 82)). However, individual areas of the setup can be enabled for the user, e.g. to allow them to change the system language or configure a left-handed mouse.

1. Under **Security → Password**, enable the password for the administrator and the **setup user**.
2. Under **Accessories → Setup Session → User Page Permissions**, enable those areas to which the user is to have access.
 - A check in the checkbox indicates that the node is visible in the setup.
 - A green symbol indicates that the user can edit the parameters on this setup page.

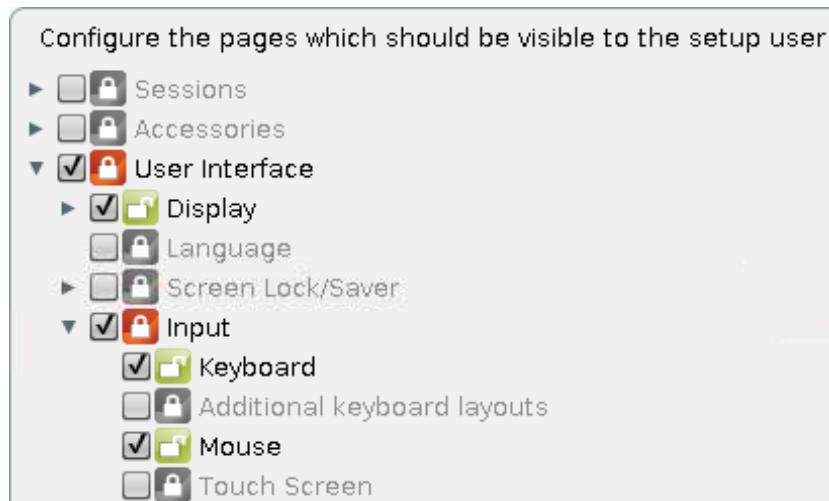


Figure 8: Restricted access to the setup

If you enable a setup page on the lower levels, the node points required for access will automatically be marked as visible (but blocked for editing purposes).

4.3.2. Quick Settings

If a password was set up for the administrator, the IGEL Setup can only be opened with administrator rights, i.e. after entering the password (see *Password* (page 82)). However, individual areas of the setup can be enabled for the user, e.g. to allow them to change the system language or configure a left-handed mouse.

1. Under **Security → Password**, enable the password for the administrator.

If users are to be allowed to edit parts of the setup only with a password, enable the password for the **setup user** too.

2. Under **Accessories → Quick Settings**, define the name and the options for bringing up the quick setup.
3. Under **Accessories → Quick Settings → Page Authorizations**, enable those areas to which the user is to have access.
 - A check in the checkbox indicates that the node is visible in the setup.
 - A green symbol (open lock) indicates that the user is able to edit the parameters on this setup page.

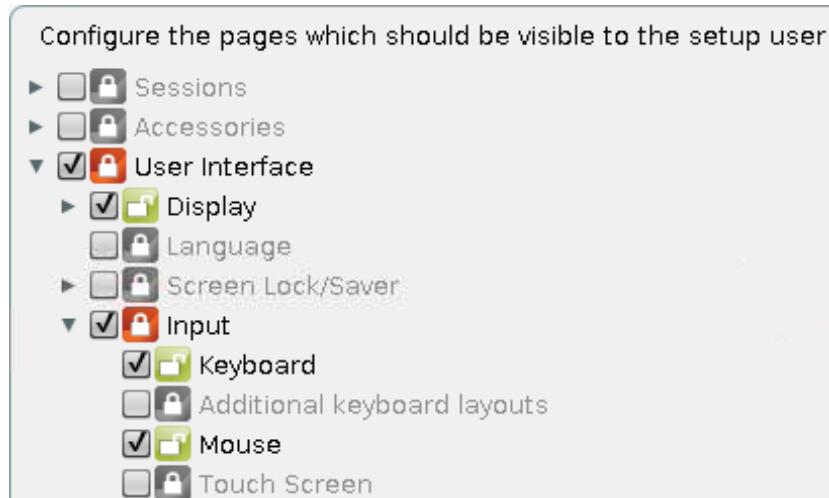


Figure 9: Restricted access to the setup

If you enable a setup page on the lower levels, the node points required for access will automatically be marked as visible (but blocked for editing purposes).

4.4. Setup Search

The **Search** function enables you to find parameter fields or values within the setup.

1. To start a search, click on the button below the tree structure.
2. Enter the text you wish to search for.
3. Specify the details for your search – narrow it down to field headers for example.
4. Select one of the hits.
5. Click on **Show Result** and you will be taken to the relevant setup page.

The parameter or value found will be highlighted as shown below.

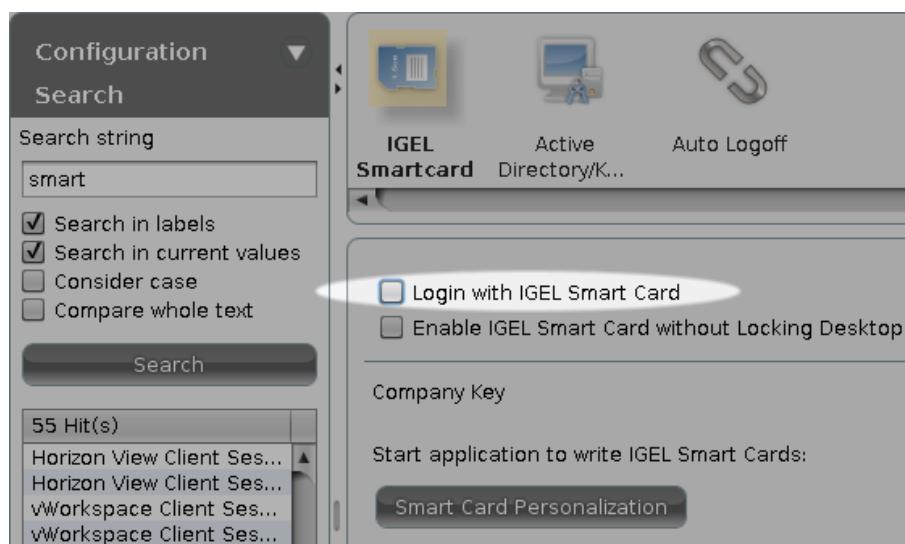


Figure 10: Setup search

5. System Settings

As previously explained under *Quick installation* (page 8), various basic system settings can be configured in the sub-structure.

Date and time (page 24)

Update (page 25)

Remote management (page 25)

VNC (mirroring) (page 26)

Remote access (SSH / RSH) (page 27)

Energy (page 27)

Firmware configuration (page 27)

IGEL System Registry (page 28)

5.1. Time and Date

1. Click on **Time and Date** to open this dialog page.

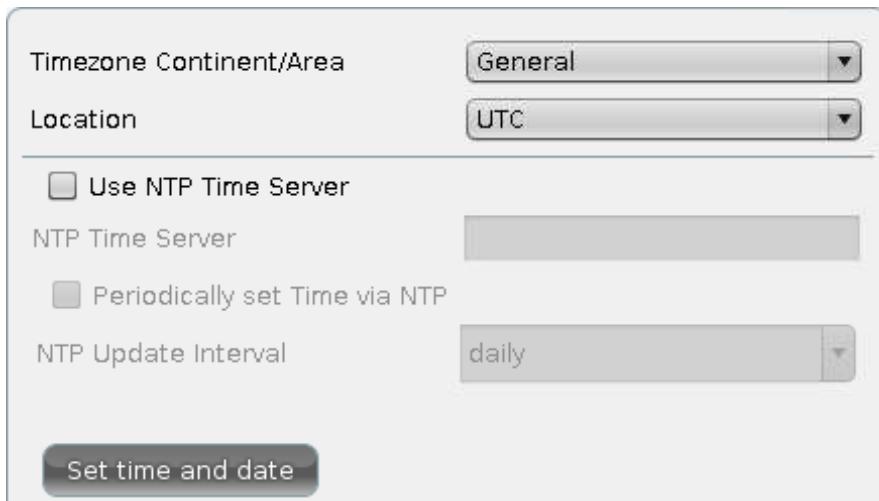


Figure 11: Set time and date

2. Make the required changes.
3. Click on **Save Time and Date** to confirm the changes.

If a time server is available within your network, you can also use the Network Time Protocol (NTP) to automatically retrieve the current time and date when the system starts and at defined intervals.

Make sure that the time zone is set correctly. To set the time zone, select the relevant region via the drop-down boxes.

5.2. Update

On the **Update** page, a simple dialog for updating your thin client firmware is displayed. The normal procedure for updating your thin client is as follows:

1. Go to www.myigel.biz and download the desired firmware image from the IGEL server.
2. Unzip the ZIP file (the usual format in which updates are provided).
3. Save all files in the directory provided either on your local FTP/HTTP server or on a drive which is accessible from the client (e.g. a USB stick, NFS share etc.).
4. Configure the necessary settings (see below).
5. Save your changes and click on **Update Firmware**.

The update process will now proceed automatically.

The update procedure cannot be carried out via PPP/ISDN connections. In this case, you should use a local storage medium (USB stick) to provide the update.

The following information must be given before the update can start (the details required vary depending on the protocol chosen):

Protocol	Allows you to select the protocol to be used (FTP, HTTP, HTTPS etc.) from the drop-down list.
Server name and port	Details of the name or IP address of the server used as well as the port that is to be used
Path name on the server	Details of the directory in which you have saved the update files - starting from the root directory
User name	The user account name
Password	The password for this user/this account

5.2.1. Buddy Update

Under **Buddy Update**, you can specify your thin client as an update server for other IGEL thin clients. If you use a thin client as an update server, only the FTP protocol can be used to update the firmware. A number of thin clients can be set up as **buddy update** servers within the network.

Thin clients without a specified update server search for available servers during the update. The first update server found then provides the update.

5.3. Remote Management

If the thin client is registered by an IGEL UMS server, the server address and the port number will be shown under **Remote Management**. You can also enter these data manually if the client is to be managed by a specific server.

- Uncheck the **Allow Remote Management** check box in order to disable the remote management service.
- Click on **Transfer the setup.ini Configuration File** to load the configuration needed for the thin client directly via DHCP.

The setup.ini will then be administered manually without the graphical setup, e.g. of the IGEL UMS. Two transfer protocols are available – TFTP and FTP. The corresponding DHCP tags are:

TFTP (disabled by default)

ID 66 Name or IP of the server
ID 67 File path on the server The setup.ini file will be searched for in <File path>/.

FTP (enabled by default)

ID 161 Name or IP of the server
ID 162 File path on the server The setup.ini file will be searched for in <File path>/igel/ud/.
ID 184 User name
ID 185 Password

It is recommended that you set the option **Disable When Updating** at the same time. This will ensure that the setup.ini and the update data are transferred separately.

5.4. VNC (Shadowing)

For helpdesk purposes, you can observe the client through shadowing. This is possible via the IGEL Remote Manager or another VNC client (e.g. TightVNC). The options for the VNC functions are as follows:

Ask user for permission	In a number of countries, unannounced mirroring is prohibited by law. Do not disable this option if you are in one of these countries!
Allow entries from remote computer	If this option is enabled, the remote user may make keyboard and mouse entries as if they were the local user.
Use password	Enable this option to set up a password which the remote user must enter before they can begin mirroring.

5.5. Remote Access (SSH / RSH)

In order to allow central administration, the thin client can be configured in such a way that it can be accessed via the WAN.

Remote access to the local setup is permitted by default. However, you can restrict remote access to a specific user from a specific host. To enable restriction, give the full name of the host (e.g. `xterm.igel.de`) and the permitted user.

5.6. Energy

Shutdown / Power Management

Here you can allow or prevent the user from shutting down the terminal or placing it in standby mode and configure the time-controlled standby mode. The standard action when the on/off button is pressed can also be pre-configured.

DPMS

If your screen supports Display Power Management Signaling, other energy saving functions are available. Three different modes are offered: **Standby**, **Suspend** and **Off**. Each mode is activated after a configurable time period (in minutes).

Naturally, all stages are gone through only if the X-Server does not receive any new entries during this period.

5.7. Firmware Customization

Various parts of the firmware can be adjusted or expanded. The individual functions are described in the chapter entitled *Firmware customization* (page 88). An overview is given below:

Custom partition	Allows you to dump your files
Custom application	Allows you to define the options for launching your own applications from the customer partition
Custom commands	Allows you to mount your own system commands and call up applications at specific times (rc.custom)
Custom bootsplash	Allows you to replace the IGEL start logos with your own graphics
Environment variables	Allows you to use dynamic parameters when configuring a number of session types
Features	Allows you to disable system components, e.g. session types that are not needed

5.8. IGEL System Registry

You can change virtually every firmware parameter in the Registry. You will find information on the individual items in the tool tips.

However, changes to the thin client configuration via the Registry should only be made by experienced administrators. Incorrect parameter settings can easily destroy the configuration and cause the system to crash. In cases like these, the only way to restore the thin client is to reset it to the factory defaults!

You can search for setup parameters within the IGEL Registry by clicking on the **Parameter Search** button. If you would like to find the FTP settings for updating the Linux firmware, you can search for the parameter name **ftp**. The parameter found in the Registry structure is highlighted:

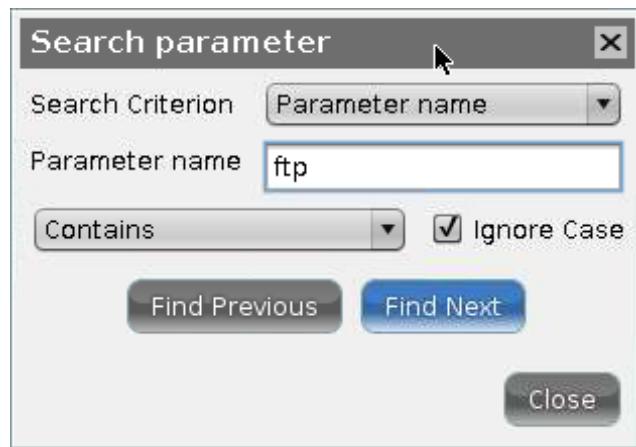


Figure 12: Parameter search in the IGEL Registry

6. User Interface

Configure the user interface exactly as you want it:

- Set the *system language* (page 33).
- Define your *entry options* (page 34).
- Expand the *character sets* (page 37).

6.1. General Display Settings

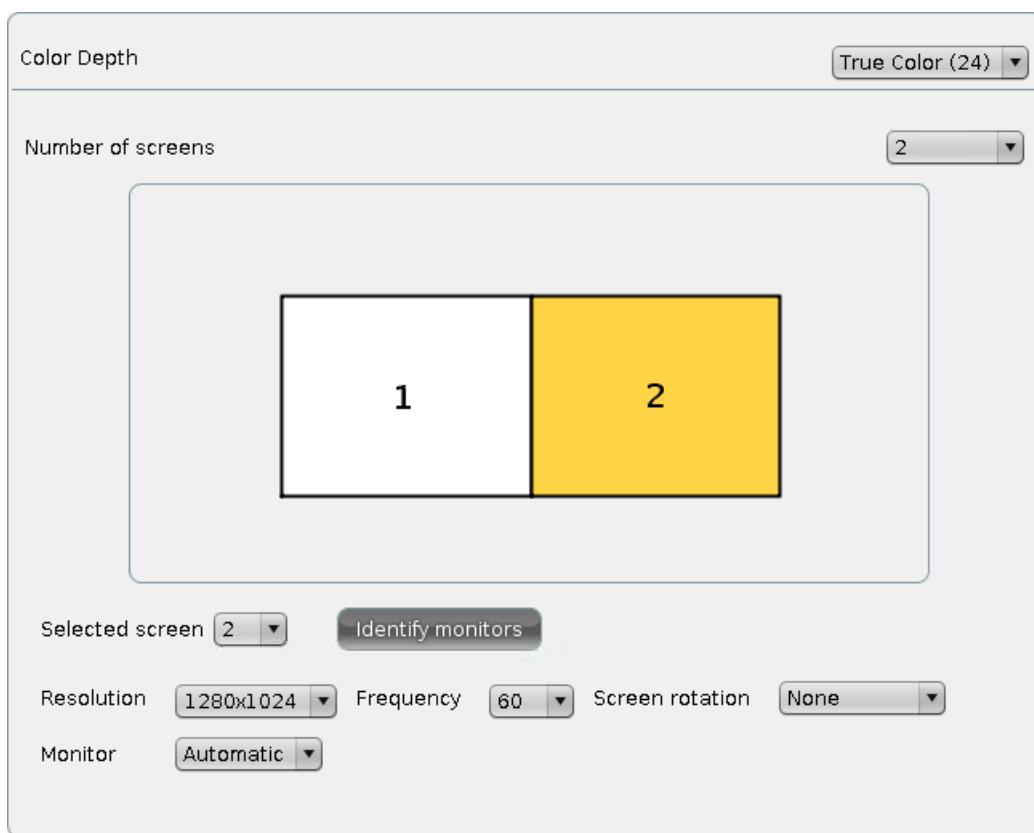


Figure 13: Screen settings

Color depth

Allows you to select the desktop color depth. The following options are available:

- 16 bits per pixel (High Color / 65,000 colors)
- 24 bits per pixel (True Color / 16.7 million colors)

Make sure that all screens connected to the thin client support the color setting.

DDC

Allows you to activate the Display Data Channel in order to share information between the system and the screen. If screen problems should occur, enable and disable the DDC setting in the **Options** by way of a test. DDC is enabled by default and the native resolution supported by the screen is determined automatically.

Screen configuration

Every screen connected to the IGEL UD device can be configured independently. The position of the individual screens can be determined in relation to Screen 1. Click on the **Identify** button to show the screen identifier on each device.

You will find the maximum supported resolutions on the data sheet of your device.

6.1.1. DPMS

If your screen supports Display Power Management Signaling, other energy saving functions are available. Three different modes are offered:

- **Standby**
- **Suspend**
- **Off**.

Each mode is activated after a configurable time period (in minutes).

Naturally, all stages are gone through only if the X-Server does not receive any new entries during this period.

6.1.2. XDMCP

Enable the XDMCP function for the screen in order to be able to select the appropriate connection type.

Please note that the local setup can then be accessed only using the hotkey **Ctrl+Alt+S**. This should therefore not be disabled for the setup application (**Accessories→Setup**).

Connection type

Allows you to select the appropriate connection type. If you select broadcast, the graphical login from the first XDMCP server that responds to a broadcast query will be provided. If you choose the connection type indirect via local host, a list of XDMCP hosts will be shown during the startup procedure. Select from this list the host that provides the graphical login.

Name or IP of the server

This field is enabled if you select the connection type direct or indirect. Give the name or the IP address of the XDMCP server you wish to use. In the direct mode, you are provided with the graphical login mask straight from the XDCMP server which you specified in the entry field. If you chose the indirect mode, a list of available XDMCP servers will be shown by the server you specified.

Make sure the Display Manager daemon (XDM, KMD, GDM ...) is running and that access authorization is available on the remote host.

6.1.3. Access Control

Thin client **access control** is enabled by default. If you disable **access control**, it will be possible to access your terminal screen from any UNIX host.

Fixed X-Key

You can grant specific users permanent remote access to your thin client. To do this, you will need to enable this option, click on the **Calculate** button and enter the 32-character key you have received into the Xauthority file on the user's computer.

List of permitted X hosts

Click on the **Add** button to open the entry mask. Give the name of the remote host (not the IP address) you would like to add and confirm this by clicking on **OK**.

6.1.4. Desktop

With the help of the following five dialog fields, you can configure the look and behavior of the desktop, windows, taskbar, pagers (virtual screens) and start menu.

Only the pager mask is described in detail. You should therefore refer to the tool tips for all other masks.

General settings	Allows you to configure the look of the desktop by changing desktop themes , fonts or the size of desktop symbols and the display and delay time for tool tips.
Background image	Here you can set up the desktop background image with pre-defined IGEL backgrounds, a fill color or a color gradient. You can also use a background image of your own. You can set up a separate background image for each monitor that is connected to the thin client.
Own background image	A user-specific background image can be provided on a download server. In the Desktop → Background window, enable the option Enable Own Background Image and give the name of the background image file. You can specify the download server in the Desktop → Background → Background Image Server window. If you have already defined a server for the system update files, you can use the same server setting for downloading the background image. The user-specific background image will be downloaded from the specified server if the function was enabled and if requested manually (Update Background Image). The download can also be launched from the IGEL Universal Management Suite via Update Desktop Changes .
Own bootsplash	A user-specific boot image can be provided on a download server. Under System → Firmware Configuration → Own Bootsplash , enable the user-defined bootsplash and specify a download server along with the name of the image file. If you have already defined a server for the system update files, you can use the same server settings for downloading the boot image. The user-specific bootsplash will be downloaded from the specified server if the function was enabled and if requested manually (Update bootsplash). The download can also be launched from the IGEL Universal Management Suite (Update Desktop Changes command or update request). The image is 800 x 600 pixels in size (aspect ratio remains unchanged). The image can be positioned vertically and horizontally by changing the position values (between 0 and 100, standard setting 50 (centered)).

The file types BMP, JPG, GIF, TIF, PNG and SVG are supported for an **own background image** and **bootsplash**. A total storage area of 25 MB is available for all user-specific images.

Taskbar	Allows you to enable/disable and configure the taskbar
Pager	<p>Allows you to enable/disable the use of several "virtual desktops"</p> <p>The Pager is a tool with "virtual desktops" which can be used as an easy way of switching between open applications. This window is shown at the right of the taskbar. It can contain either a single "virtual desktop" or several "virtual desktops". If you use a Pager, you can switch between full-screen applications at the click of a mouse.</p> <p>Instead of minimizing/maximizing sessions or switching between them using key combinations, you simply click on the desired screen using the mouse. The screen is then shown as it was when you closed it (unless you restarted the system beforehand).</p>

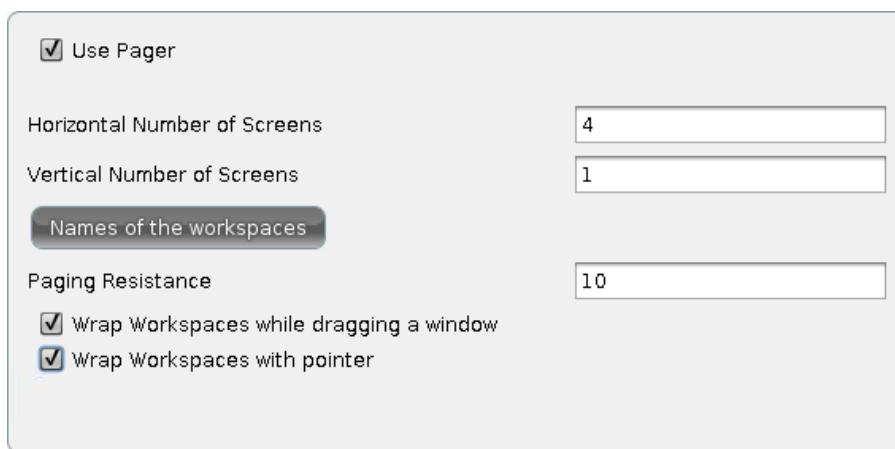


Figure 14: Pager setup

Reference	Allows you to access all open sessions of all virtual desktops via the taskbar on each screen
Menu	Determines the behavior of the start menu

6.1.5. Screen Saver and Screen Lock

You can set up the screen saver so that it is activated either automatically or in response to a key combination (**hotkey**). You can also select a password option. The look of the taskbar can be configured separately for the login dialog and the locked screen.

6.2. Language

Select the system language from the list. You can also set the keyboard layout and the entry language depending on the system language.

The chosen language is the language for the user interface and therefore applies for all local applications.

6.3. Input

These setup pages allow you to set the keyboard layout and other entry options.

The following parameters can be configured:

- *Keyboard* (page 34)
- *Mouse* (page 35)
- *Touchscreen* (page 35)

6.3.1. Keyboard and additional Keyboard

Keyboard layout	Determines the keyboard layout. The selected layout applies for all parts of the system including emulations, window sessions and X applications.
Keyboard type	Determines the keyboard type.
Key repeat	Determines the automatic repeat behavior for the keyboard: <ul style="list-style-type: none">• Initial key repeat delay – Determines the delay (in milliseconds) before automatic repetition begins.• Key repeat rate – Determines how often a character repeats per second.• Enable dead keys – Enable this function if the keyboard used supports dead keys for special characters.
Boot with NumLock enabled	Stipulates that NumLock is to be automatically enabled during the boot procedure.

➤ You can define additional keyboard layouts which can be selected by the user. The layout can be selected in the taskbar.

6.3.2. Mouse

Mouse type and mouse connection	Determines the type of mouse used and how it is connected
Left-handed mode	Changes the orientation of the mouse by switching the mouse buttons to left-handed mode.
3-button mouse emulation (no support for serial mouse)	Enables/disables emulation of the third (middle) mouse button for mice with only two physical buttons. This third button is emulated by pressing both buttons at the same time. If 3-button emulation was enabled, the emulation time limit determines how long (in milliseconds) the driver waits before deciding whether two buttons were pressed at the same time.
Mouse speed	Determines the mouse resolution in counts per inch
Mouse double-click interval	Changes the maximum interval (in milliseconds) between two consecutive mouse clicks which are to be recognized as a double-click.

6.3.3. Touchscreen

To ensure that you can open the setup and navigate within it, the initial configuration should take place with a mouse and keyboard connected. The setup procedure with a screen keyboard is described below.

A list of the touchscreens currently supported by IGEL Universal Desktop Linux can be found in the *IGEL 3rd party hardware database*

<https://www.igel.com/en/service-support/linux-3rd-party-hardware-database.html>.

Touchscreen is already calibrated

If you enable the touchscreen function, the touchscreen must be calibrated first. If this option was not enabled, calibration will begin automatically after each system boot.

Swap X and Y values

Enable this option if the mouse pointer moves vertically when you move your finger in a horizontal direction.

Minimum/maximum X value/Y value

These values are determined by the calibration tool. However, you can also change them manually.

Let-go limit

The maximum permitted time (in milliseconds) between two instances of contact in order to still be registered a single touch. When moving windows by drag-and-drop, for example, your contact with the screen may inadvertently be interrupted. Increasing this value prevents the thin client from recognizing two individual contacts if you let go in this way.

Contact limit

Determines how long (in milliseconds) the screen needs to be touched in order for the contact to be recognized.

Baud rate (for serial touchscreens only)

Determines the speed of communication via the selected connection. (If in doubt, read the monitor manual.)

Touchscreen connection

You can connect the touchscreen either to COM1 or COM2. Select your preferred connection here.

Set driver-specific default settings

Click on this button once after changing the touchscreen type or to restore the default settings.

➤ Enable the screen keyboard for touchscreen use in the setup under **Accessories → Screen Keyboard**.

The layout for the normal keyboard will also be used for the screen keyboard.

Calibrate the touchscreen for optimum contact recognition. The touchscreen calibration application can be found in the **Application Launcher → System**.

After launching the calibration program, you will see a pattern with calibration points which must be touched one after another.

6.3.4. SCIM (Input Methods)

The Smart Common Input Method (SCIM) platform offers entry methods for over 30 languages under Linux. You can enable one of the methods provided by the IGEL system for Chinese character sets (Simplified Chinese, Traditional Chinese) or manage generic tables for describing the entry method.

6.3.5. Signature Pad

Enable use of the SOFTPRO Virtual Serial SignPad (VSSP) signature pad in sessions (COM port mapping).

USB signature pads are made available in the sessions via COM port mapping.

1. To do this, enable **support** under **User Interface → Entry → Signature Pad**.
2. Apply this change by selecting **Apply** or **OK**.
3. Enable **COM port mapping** for the device `/dev/ttyVSSP0` in the session configuration.

6.4. Keyboard Commands – Hotkeys

You will find a list of existing keyboard commands for window management here. A keyboard combination can be defined for each function.

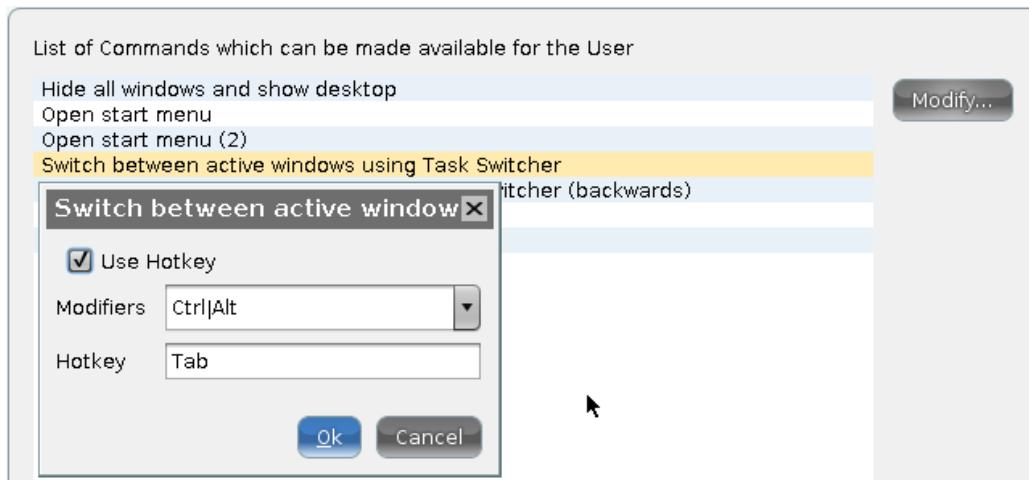


Figure 15: Keyboard commands

6.5. Font Services

You can import further font sets in addition to the ones provided by IGEL:

- *XC font service* (page 37)
- *NFS font service* (page 38)

6.5.1. XC Font Service

If you need other fonts in addition to the ones offered by the thin client, you can use the XC font service.

This service must be installed on the server and fully configured there.

The advantage of using the XC font service rather than NFS is its better performance.

➤ Click on **Enable XC Font Service** in order to enable the following entry fields.

XC font server	Give the name of the server on which the XC font service operates.
Port number	Give the number of the port used by the font service for reception purposes - the default setting is port number 710.
Favor local fonts	Enable this option if local fonts are to be used before a request is sent to the font server.

6.5.2. NFS Font Service

Using the NFS font service is another way to import additional fonts. The NFS font service also offers the advantage that the mount point for the fonts can be configured. This is necessary for a number of remote applications that search for your fonts in a specific directory.

➤ Define and enable an NFS font path entry in order to use the NFS font service.

This will be added to the **list of NFS mounted font directories**.

➤ Click on **Add** to open the dialog window:

Local directory	Defines the local directory for the mount point
NFS server	Name or IP address of the server that makes available the font directories via NFS.
Server path	Path on the server under which the fonts are available.
Favor local fonts	If this option is enabled, local fonts are to be used before a request is sent to the font server.

➤ Click on **Enable** to enable the entry.

➤ Export the font directory to the server via NFS read-only for the thin client.

7. Network

LAN interfaces (page 39)

DHCP options (page 43)

VPN (page 43)

SCEP (page 46)

Routing (page 47)

Hosts (page 48)

Network drives (page 48)

7.1. LAN Interfaces

- Click on **Network** → **LAN Interfaces** in the client setup.
- Choose between automatic network setup with the protocols DHCP and BOOTP or manual network configuration in order to set the thin client for each network interface.

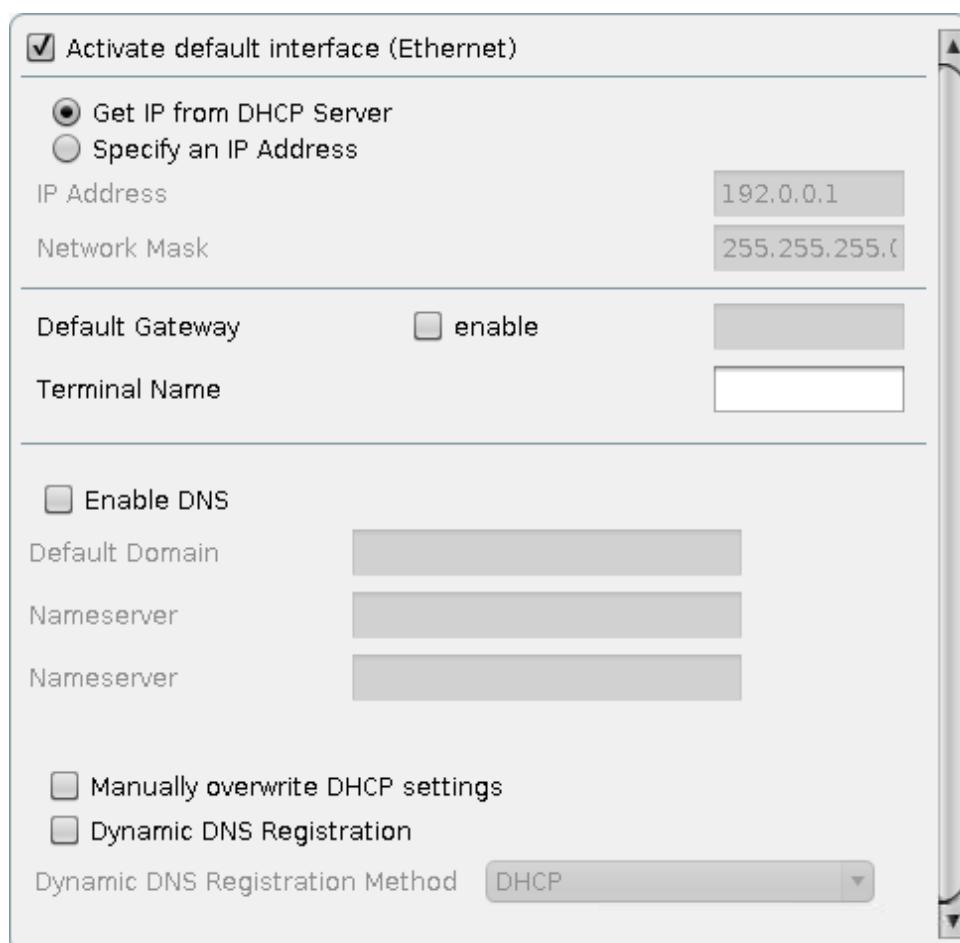


Figure 16: LAN Interfaces

DHCP	Via the Dynamic Host Configuration Protocol, the thin client receives its IP address, network mask, DNS, gateway and other network configurations from a DHCP server. DHCP is enabled by default for LAN 1 (internal). DHCP options can be enabled in the DHCP Client menu. A list of standard options is available. However, you can also define your own options.
BOOTP	Via the BOOTP , the thin client receives its IP address, network mask, DNS, gateway and other network configurations from a BOOTP server database.

The transferring of a `setup.ini` file or a boot script is not supported. BOOTP is not used to call up a boot image from a server and boot this image, in spite of what the term may imply.

Specify IP address manually	Configures the network settings manually instead of searching for a DHCP server. Ensure that the fixed IP address that you enter is not used by another computer in your network. If you have to use a gateway to forward the data packages to and from the target network, click on Enable and enter the gateway IP address.
Terminal name	Give the local name of the thin client. Otherwise, the standard name <code>IGEL-<MAC address></code> will be generated.
Enable DNS	Configures the DNS - Specify the standard domain in which the device will work as well as the IP address of up to two name servers which will be queried one after the other.

7.1.1. Authentication

Enables IEEE 802.1x authentication (Wired 802.1x only)	Enables network port authentication in accordance with the 802.1x standard. The following authentication methods are currently supported: <ul style="list-style-type: none">• EAP-PEAP/MSCHAPv2• EAP-PEAP/TLS• EAP-TLS
--	--

The entry options in the **Authentication** menu vary depending on the authentication method chosen. If the fields **User Name** and **Password** are not already populated, an entry mask for authentication purposes will be shown.

EAP type	Selects the authentication method: <ul style="list-style-type: none">• PEAP for EAP-PEAP/MSCHAPv2 and EAP-PEAP/TLS• TLS for EAP-TLS
Check server certificate	Checks the authentication server
CA root certificate	Path name of the file with root certificate(s) for server authentication. The file may be in PEM or DER format.
PEAP/Auth method	Select the Phase 2 authentication method <ul style="list-style-type: none">• MSCHAPv2 for EAP-PEAP/MSCHAPv2• TLS for EAP-PEAP/TLS.
EAP-PEAP/MSCHAPv2/User name	Retains the user name for logging in for MSCHAPv2 authentication.
EAP-PEAP/MSCHAPv2/Password	Retains the password for MSCHAPv2 authentication.
EAP-PEAP/TLS/Client certificate	Path name of the file with the certificate for client authentication in the PEM (base64) or DER format. Leave empty if a private key in the PKCS12 format is used.
EAP-PEAP/TLS/Private key	Allows you to enter the path name of the file with the private key for the client certificate in the PEM (base64), DER or PFX format
EAP-PEAP/TLS/User name	User name for logging in for TLS authentication
EAP-PEAP/TLS/Password for private key	Password for accessing the encrypted private key in the private key file
EAP-TLS/Client certificate	Path name of the file with the certificate for client authentication in the PEM (base64) or DER format; leave empty if a private key in the PKCS12 format is used.
EAP-TLS/Private key	Path name of the file with the private key for the client certificate in the PEM (base64), DER or PFX format
EAP-TLS/User name	User name for logging in for TLS authentication
EAP-TLS/Password for private key	Password for accessing the encrypted private key in the private key file.

For IEEE 802.1x authentication purposes, the client certificate can also be requested and administered via SCEP. See *Network/SCEP* (page 46).

7.1.2. Wake-on-LAN

Select the packages or messages with which the thin client can be started via the network.

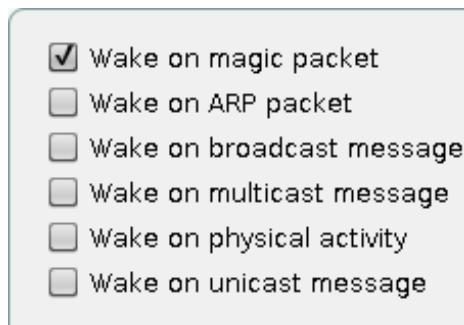


Figure 17: Wake-on-LAN options

7.2. Wireless (WiFi)

If you use the optional IGEL WLAN modules or have installed a wireless LAN card (USB, PCI) of your own, you can configure the **Wireless LAN** interface in this dialog field.

In the **Wireless** sub-section of the **Authentication** page, you can change the encryption settings. Various parameters are available depending on your preferred encryption type.

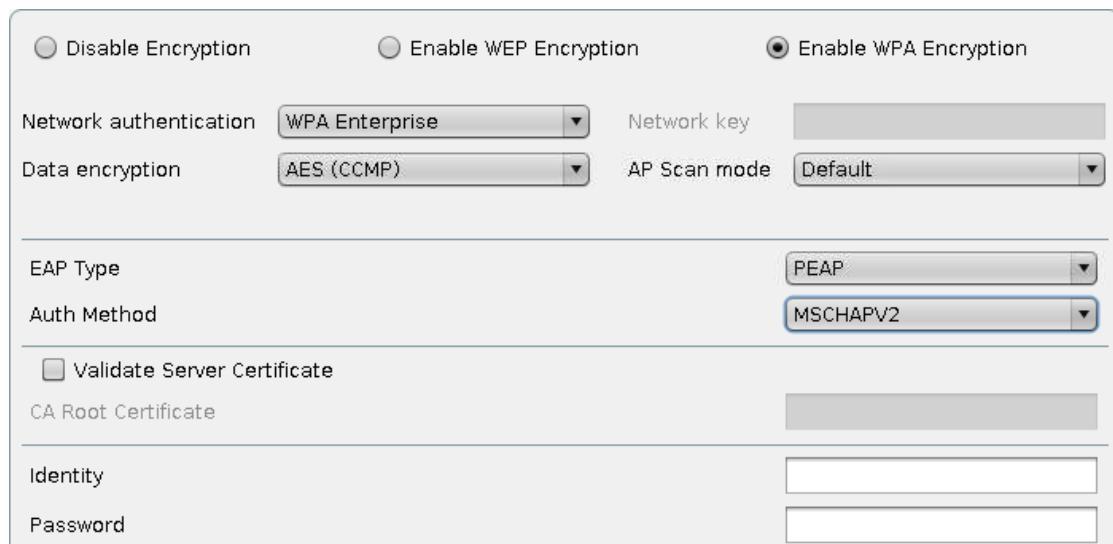


Figure 18: Changing encryption settings

For WPA(2) Enterprise encryption, the client certificate can also be requested and administered via SCEP. See **Network/SCEP** (page 46).

7.3. DHCP Options

Configure the client's use of DHCP options - a number of **standard options** are already set out in a list and can be enabled. **User-defined options** can be set up in a list of your own and managed there.

7.4. Virtual Private Network – VPN

Remote users securely access company networks via virtual private network protocols (VPN). You can set up your client accordingly for this purpose.

7.4.1. PPTP

PPTP (point-to-point tunneling protocol) is one of the most common virtual private network (VPN) protocols allowing remote users to securely access company networks.

Automatically establishing a connection during the boot procedure

In order to set up a client which is fully configured to automatically establish a connection, you may need to dial up first.

1. Enable this option before the desktop is launched.
The client connects to the host.
2. Click on **Add** to set up new connections.
3. Configure the necessary settings in order to dial up the RAS server on the desired remote station.
4. Select the network device and specify whether a dial-up connection is to be used.
5. Specify on the **Options** tab the name service and the IP configuration for the PPTP connection.

These data will normally be transferred from the remote station's RAS server. This means that both DNS and IP address will be set to **automatic** by default.

You can set up additional network routes on the next three setup pages (Routing).

7.4.2. 3rd Party VPN-Clients

IGEL Universal Desktop Linux v5 includes two clients from other manufacturers for access to a VPN:

Cisco (page 43)

GeNUCard (page 44)

Cisco

You will find the configuration parameters for the Cisco Client in the IGEL setup.

To use the software, please read the VPN Client Administrator Guide and the User Guide from Cisco:

http://www.cisco.com/en/US/products/sw/secursw/ps2308/prod_maintenance_guides_list.html

http://www.cisco.com/en/US/products/sw/secursw/ps2308/products_user_guide_list.html

GeNUCard

The GeNUCard offers a choice of pre-configured Internet and VPN connections. The selection window opens as soon as the GeNUCard session is launched.

The available options for launching the session can be defined under **Desktop Integration** in the session configuration.

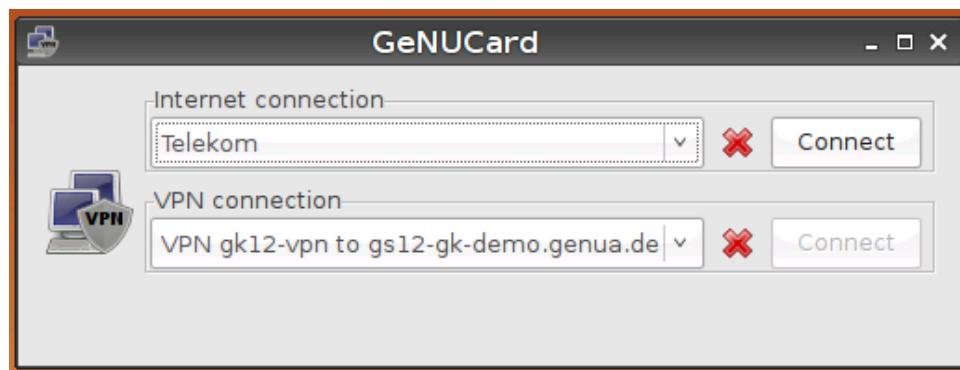


Figure 19: GeNUCard configuration

A valid combination of connection and user data can be pre-populated in the IGEL setup:
Network→VPN→GeNUCard→Options.

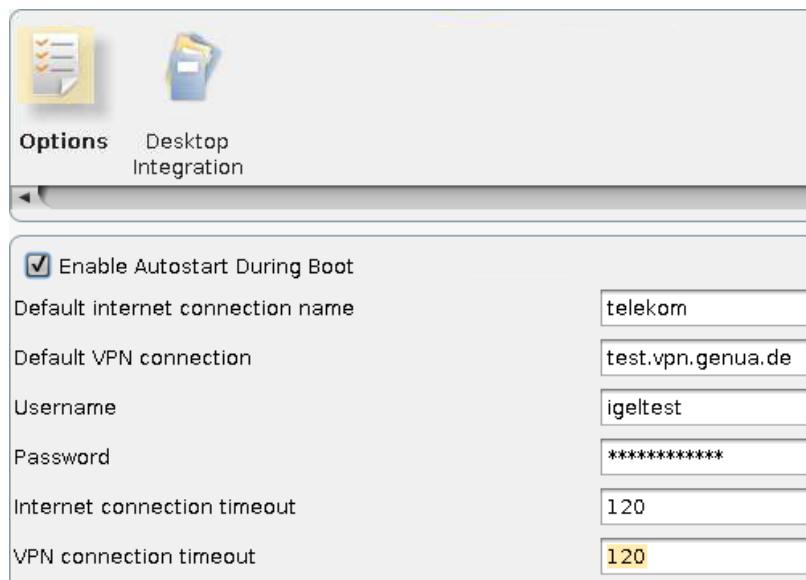


Figure 20: Automatically establishing connections

A facility for automatically establishing a connection during the boot procedure can also be enabled. This is necessary when updating the IGEL firmware via the VPN for example.

The GeNUCard is configured and administered centrally via the genucenter management station. Further information is available from www.genua.de.

Optionally, an administrator session allowing the GeNUCard Internet connection to be configured can be set up:

1. Click on **Add Instance** under **System→Registry→genucard%**.

The GeNUCard icon will appear on the desktop.

2. Click on the GeNUCard icon.

The GeNUCard login window will open.

3. Enter a **user name** and **password**.

4. Click on **Login**.

The Internet/VPN window will open.

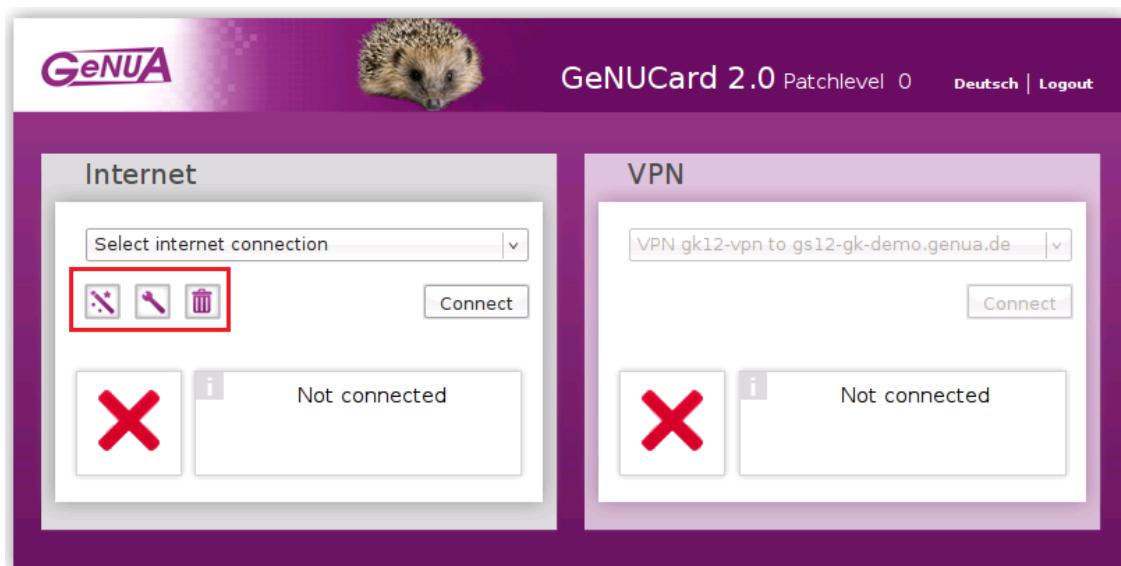


Figure 21: Internet/VPN window

5. In the **Internet** area, configure the connection with the help of the **Create**, **Edit**, **Delete** buttons.

7.5. Simple Certificate Enrollment Protocol – SCEP

The SCEP allows the automatic provision of client certificates via an SCEP server and a certification authority. This type of certificate is automatically renewed before it expires and can be used for purposes such as network authentication (e.g. IEEE 802.1x).

A Microsoft Windows 2008 Server (MSCEP, NDES) for example can serve as a queried counterpart (SCEP server and certification authority). More information can be found at Microsoft, e.g. in the white paper.

<http://download.microsoft.com/download/a/d/f/adf2dba9-92db-4765-bf2d-34b1c8df9ca3/Microsoft%20SCEP%20implementation%20whitepaper.doc>

- Enable certificate management via SCEP client (NDES) and then make the necessary configuration settings.

7.5.1. Certificate

- Under **Certificate**, specify the basic date for the certificate to be issued by the certification authority.

Type of CommonName	If the client automatically obtains its network name, DNS Name (auto) is a good type of thin client certificate.
Organizational unit	Stipulated by the certification authority.
Organization	A freely definable designation for the organization to which the client belongs.
City, state, country	Enter the location of the client here.
RSA key length	Select a key length (one able to be used by the certification authority) for the certificate that is to be issued.

7.5.2. Certification Authority

- Enter the name of the certification authority (CA) and the hash value of the root certificate.
You will receive both of these from the certification authority.

7.5.3. SCEP

In addition to a certification authority, an SCEP server must also be defined.

- Enter the **address** and **query password** for the SCEP server here.

The SCEP server generates the password as a one-time password. It is needed when a certificate is requested for the first time. New certificates will be requested before the old ones expire. In this case, the still-valid certificate will serve as a means of authentication.

- For the purpose of checking validity, define an **interval** (checking frequency) and a **period of time** in which certificate renewal must occur.

Example:

A certificate is valid until 31.12 in any one year. The period for renewal is 10 days. This means that a new certificate will first be requested on 21.12 of the same year.

Because of the need to enter a fingerprint (root certificate of the certification authority) and the query password (SCEP server), the configuration process is somewhat awkward. Ideally, it should be set up in the UMS as a profile and distributed to the clients. At the same time, the certificate still cannot be used for communication purposes.

7.5.4. Checking the Client Certificate

If a certificate from the certification authority has been forwarded from the SCEP server to the client, it is then stored there in the `/wfs/scep_certificates` folder.

The data for the certificate (e.g. its validity, creation date and hash value) can be displayed by using the shell command `cert_show_status`.

7.5.5. Example

Certificates issued and managed via SCEP can be used for purposes such as network authentication.

Relevant options can be found when configuring IEEE 802.1x authentication

Network → LAN Interfaces → Interface 1 → Authentication

or when setting up the wireless network

Network → LAN Interfaces → Wireless → Authentication, WPA Enterprise Encryption, EAP Type TLS.

One problem when the client certificate is distributed via the network is that the same certificate is needed for communication. The use of the SCEP in conjunction with 802.1x authentication presents no problems to the extent that the initial request for the certificate should also be possible without a certificate.

➤ Enable the 802.1x authentication method after the SCEP has been configured.

When requesting the certificate, the client will attempt to establish a connection to the SCEP server without using any authentication. It will use the authentication only after having received the certificate.

For WLAN connections, a method of certificate-less PSK encryption must first be set up. The client will then use this connection to obtain the certificate. After this, the WLAN connection can be reconfigured once again.

While the above-mentioned method for Ethernet connections will also function via the UMS, the initial configuration of the WLAN can only be performed on the client as the WLAN is disabled by default.

7.6. Routing

This setup page allows you to specify additional network routes if necessary.

- In the **Interface** field, specify "eth0", "eth1" or "wlan0", i.e. Interface 1+2 or Wireless LAN.

You can specify up to five additional network routes.

7.7. Hosts

If no DNS (Domain Name Service) is used, you can specify a list with hosts in order to allow translation between your IP address, the full qualified host name and the short host name.

Click on **Add** to open the dialog window.

1. Enter the **IP address** of the host you would like to add.
2. Give the **full qualified host name** (e.g. <mailserver.igel.de>).
3. Give the **short host name** of the host (e.g. <mailserver>).
4. Confirm the details you have entered by clicking on **OK**.

The specified host will now be added to the computer list.

7.8. Network Drives

Drives shared within the network can be linked to the thin client via NFS or SMB - depending on the protocol offered by the server.

7.8.1. NFS

With NFS (Network File System), you can share files via the network. The NFS server exports a system file, and the NFS client (your thin client) links this file to a mount point within its own file system. The exported file system then becomes a logical part of the thin client file system although, in physical terms, it remains on the server.

In order to set up an NFS mount, the server must first be configured. You will find detailed information on NFS on the relevant pages of the manual for your server operating system.

The procedure for sharing files via the NFS server is as follows:

- Click on **Add** to open the dialog window for NFS.

You can then enter the following:

Enabled	The NFS mount is enabled by default and is mounted each time the system boots. Disable this entry if the shared file system is not universally needed.
Local directory	Details of the local directory onto which the shared items are to be mounted on the local thin client file system.
Server	The name or IP address of the NFS server which provides the shared files.
Path name	Details of the path name as exported by the NFS server.

7.8.2. Windows Drive - SMB

SMB is used by Microsoft Windows NT, Windows 95/98, Windows 2000 and Windows XP etc. to share hard drives and printers. As Unix (including Linux) can process this protocol with Samba Suite tools, hard drives and printers can be used along with Windows hosts. Consequently, items shared via SMB can be integrated into the thin client by Windows or Unix Samba hosts.

The SMB protocol is used only to share files via the network (not for printers). Shared items which are to be mounted must first be created on the Windows or Unix host.

Local directory	Details of the local directory onto which the shared items are to be mounted on the local thin client file system.
Server	For a Windows host, the Net BIOS name must be entered here. For a Unix Samba host, the host name or the IP address must be used.
Share path name	Path name as exported by the Windows or Unix Samba host.
User name/password	Details of the user name and password for your user account on the Windows or Unix Samba host.
Enabled	The SMB mount is enabled by default and is mounted each time the system boots.
Writable for users	If this option is enabled, the user who is logged on can write data. Otherwise, this is only possible via root.

7.9. Proxy

Select the communication protocols for which a system-wide proxy is to be used.

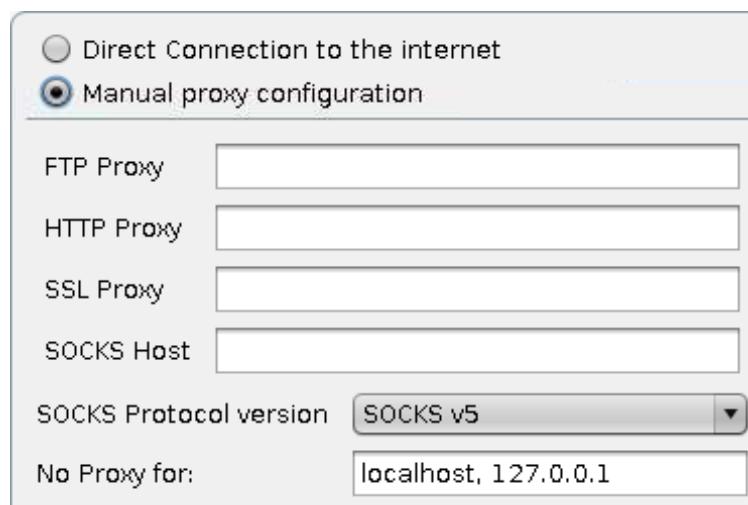


Figure 22: System-wide proxy

8. Sessions

Application sessions can be created and configured in the **Sessions** sub-structure of the IGEL setup application. The **Session Overview** provides an overview of all available session types and existing sessions.

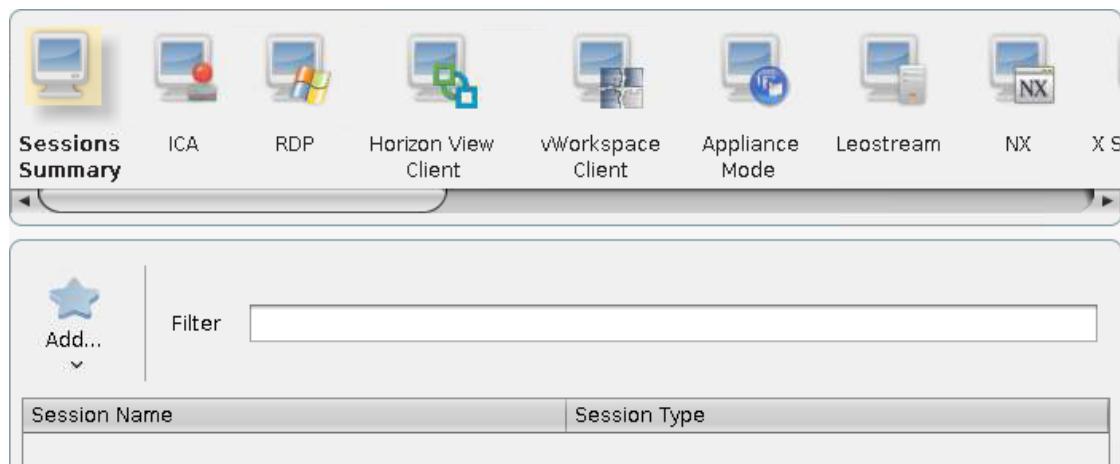


Figure 23: Session overview

- Click on **Add** to create a new session.

Disabled services are not shown in the drop-down list.

For each session there is a configuration page entitled **Desktop Integration** on which the following actions can be performed:

- Determining the look of the session on the local desktop
- Setting up the name of the session

Note: None of these characters can be used in the session name: \ / : * ? " < > | [] { } ()

- Selecting the session start options (autostart, restart)
- Enabling hotkey use

8.1. RDP – global settings

This section describes the procedure for configuring the global RDP settings. This configuration applies for all RDP sessions. The protocol version can no longer be configured manually, while the version used by the server is automatically recognized and used.

8.1.1. Local Logon - RDP

Local login allows user data pre-population, e.g. with data from the domain login, when establishing the connection to the terminal server. This can save you having to enter the same login data on a number of occasions.

You can also use **Local login** to freely select the server in the login window of an RDP session.

Enable **Use local login window** to

- Pre-populate user data
- Freely select the server in the login window of an RDP session.

If the user data, e.g. the data from the domain login, are pre-populated, this can save you having to enter the same login data on a number of occasions.

Use local login window

If this option is enabled, you will need to enter the password in the RDP login window on the terminal side when logging in.

Pre-populate login information

The login window is pre-populated with the user name and domain.

Type

Here, you can pre-populate the user name and domain in the login window and choose between the settings from the last login and the session setup.

Show domain

Shows the domain entry in the login window.

Set client name as user name

This setting may help to resolve reconnection problems during load balancing.

Restart mode

The RDP login window is displayed in restart mode and cannot be closed.

Enable network authentication

Enables network authentication via NTLM. Smartcards are not supported here.

Domains

Allows you to add domains which are to be available. If you enter a number of domains, these will be shown in the **Domains** drop-down area in the login module.

8.1.2. Window

The following settings are configured under Window:

Standard number of colors	Specifies the standard color depth - the default setting is a color depth of 256 colors.
Approximate colors	Given the differences between the color palettes used by the ICA client and the "thin client" desktop, the screen may flash annoyingly if you switch between windows on a pseudo-color screen. The ICA client's color adaptation scheme prevents this flashing as it uses the colors from the local desktop palette in order to display the ICA window session. If Approximate Colors is enabled, flashing when switching between windows is avoided.
Window size	Specifies the width and height of the window.
Embed systray icons in window manager taskbar	Inserts an application icon into the local taskbar
Font smoothing	Enables font smoothing - in the event of performance problems, font smoothing should be switched off as it requires additional computing power.
Multi Monitor	Stipulates whether the full-screen mode is to be extended to all monitors.

8.1.3. Mapping

Locally connected devices such as printers or USB storage devices can be made available in RDP sessions.

Drive Mapping

Through drive mapping, connected mass storage devices can be made available to the user. Specify which folders or drives are mapped during the login.

Via **Enable drive mapping**, you can temporarily enable/disable drive mapping. This offers the advantage that stored settings can be enabled or disabled without being lost.

Local (USB) devices which are to be used for drive mapping purposes must first be set up as devices.

The procedure for setting up drive mappings is as follows:

1. Click on **Add** to bring up the mapping window.
2. Select a **target drive** from the list under which the local device or the folder is to be mapped.

If the drive letter you have selected is no longer available on the server, the specified directory or local drive will be given the next free letter during the login.

3. Give the path name of the local directory to which the mapping is to refer.

If you map a locally connected device, use the pre-defined path names available in the drop-down field. The directories in question are those on which the devices are mounted by default during the boot procedure (e.g. `/autofs/floppy` for an integrated disk drive).

Serial (COM) Ports

Enable **Enable COM Port Mapping** in order to perform bidirectional mapping between serial devices connected to the thin client (e.g. scanners, serial printers) and the serial ports of the Citrix server.

As a result, programs running on the server can exchange data with the local devices.

- Click on Add under **Serial Devices**.
- From the drop-down list, select the serial connector to which a device is connected or click on **Search Devices...** to select an available device.

`/dev/ttyS0` Denotes the local serial connection COM1

`/dev/ttyS1` Denotes the local serial connection COM2

COM3 and COM4 Denote possible expansion cards installed in the PCI/ISA slot, e.g. an internal modem

USB COM1 to USB COM4 Denote serial connections to USB-to-serial adapters.

Your selection will be mapped to the virtual COM1 connection. A second device will be mapped to the virtual COM2 connection and so on.

Printers

You can set up a printer for RDP sessions here.

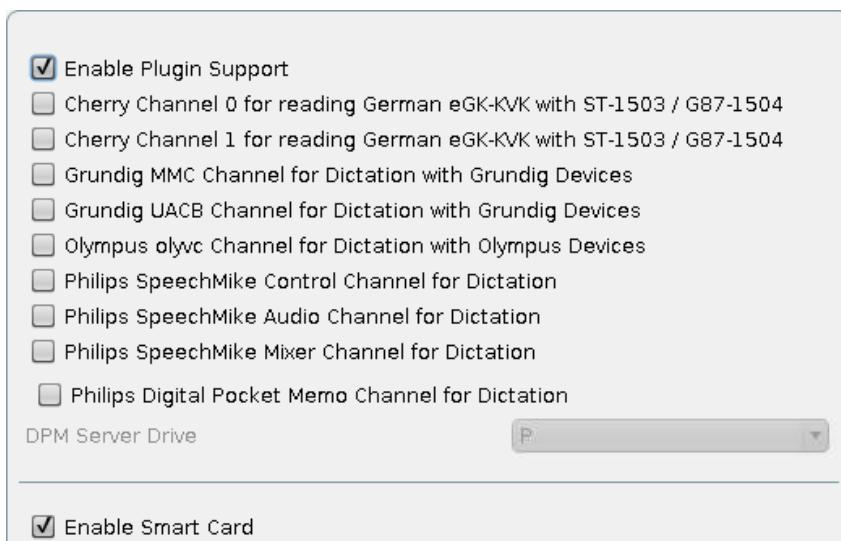
With the **Enable Client Printer Mapping** function, the locally connected thin client printer is made available for your RDP sessions, provided that it was not disabled on the server side.

The printers must be set up on the **Devices→Printers→CUPS→Printers** page and must be enabled there for mapping in RDP sessions.

Because the thin client merely places incoming printer jobs in a queue, you need to install the printer on the server.

Device Support / Virtual Communication Channels

Enable virtual RDP channels for communicating with various devices connected to the thin client. These can be card readers (smartcards), dictation machines or even USB storage devices. Channels of this type allow the device to communicate with the relevant server application.



DriveLock

The virtual DriveLock channel (RDP) is included in the UDLX from Version 5.01.100 and must be installed on the RDP server.

DriveLock can read hardware data from local USB devices and transfer these data to the server with the help of the Virtual RDP Channel Extension. When using whitelists, rules based on the hardware properties of the connected drive (e.g. manufacturer details, model and serial number) are taken into account.

The following steps are important in order to be able to define the access rights for drives via the DriveLock server configuration:

- Enable the USB devices via drive mapping so that they are available as drives within your terminal session.
- Check the settings under **Sessions→RDP→RDP Global→Mapping→Drive Mapping**, they should correspond to the DriveLock settings.
- Disable RDP-USB redirection, because this will otherwise prevent drives being recognized by DriveLock.
- Check the device settings under **Devices→Storage Devices→USB Storage Hotplug**, as they can influence the USB devices during the RDP session.
- Install and enable the DriveLock channel in the Universal Desktop setup under **Sessions→RDP→RDP Global→Mapping→Device Support**.

In the Centertools download area, you will find a document which describes in greater detail the procedure for configuring DriveLock on the server side: [How to use Centertools DriveLock with IGEL Thin Clients](#)

Audio

Allows you to enable local audio transmission.

8.1.4. Performance

In the event of performance-related problems, disable graphics functions which are not absolutely necessary. In low-bandwidth environments, you should use compression in order to reduce the network traffic.

Please note that this uses additional CPU power.

RemoteFX Support

With the Service Pack 1 for Windows Server 2008 R2, local system functions such as Windows Aero or 3D display can be made available in RDP sessions too. In order to do this, the RemoteFX extension for RDP must be enabled. You can configure the relevant settings under **RDP Global → Performance** or on the corresponding session settings.

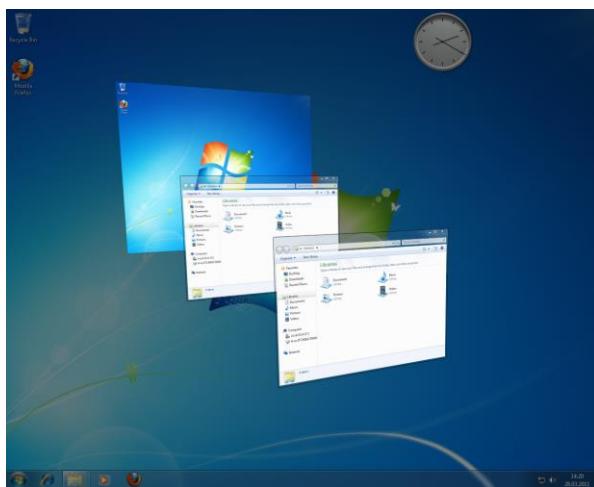


Figure 24: Windows Aero

Globally enabling Remote FX is not recommended as conventional RDP sessions may also be affected by this. With RemoteFX, all graphics effects available under Performance are enabled. This may slow down the session as a result. It is better to enable the function only for individual sessions which establish a connection to appropriately equipped servers.

Further information on Remote FX and the server-related requirements is available from Microsoft at <http://technet.microsoft.com/en-us/library/dd736539%28WS.10%29.aspx>.

In the IGEL Registry, you can configure the number of frames sent by the server without confirmation under the key `rdp.winconnect.remotefx-ack`. The standard value is 1. A value of 2 or 3 can lead to improved performance in networks with high latency times.

8.1.5. Options

Disable mouse events	Instructs the client not to show "unnecessary" cursor movements in order to conserve power.
Reset license	If you have to remove the MS license from the device, enable this option and restart the device.
Client name	Give a client name for terminal service identification - the standard setting is the host name of the computer.
TLS (SSL from Version 3.1) encrypted connections	Permits TLS-encrypted connections only / verifies server certificates / deletes certificates that are no longer needed
RDP Legacy Mode	Switches to prior (IGEL Linux v4.x) RDP client version - see note below!

Before using **RDP Legacy Mode** to solve any occurring problem with the current RDP client (IGEL Linux v5) please contact IGEL support to address your issue. **RDP Legacy Mode** may be removed with any later version of IGEL LInux.

8.1.6. USB Redirection

USB devices can be permitted or prohibited during an RDP session on the basis of rules. Sub-rules for specific devices or device classes are also possible.

Use either **Native USB Redirection** or **Fabulatech USB Redirection**.

For **Fabulatech USB Redirection**, a special Fabulatech server component must be installed on the server (USB for Remote Desktop Igel Edition).

More detailed information on the function can be found on the Fabulatech partner site:
<http://www.usb-over-network.com/partners/igel/>.

Enable either native or Fabulatech USB redirection – not both together.

Disable USB redirection if you use Centertools DriveLock.

8.1.7. Multimedia (Video) Redirection

To improve video playback on the remote desktop, follow the procedure below:

1. To take advantage of improved playback, ensure that the necessary codecs are installed on the remote desktop page.
2. Enable multimedia redirection on the thin client.
3. Create the session.
4. Begin playback on the remote desktop.

8.2. RDP session

The following configuration pages offer you detailed setup options for the session:

Server and logon	Allows you to specify a server and a start application for the terminal server session. The necessary logon information is configured here. Otherwise, the terminal server logon window for entering the user and the password will be displayed.
Window	Allows you to specify the size of the session window and the color mode. The local taskbar can be configured so that it remains visible during a full-screen session.
Performance	Allows you to disable non-essential graphical functions such as skin styles, window animation etc. This is useful in the event of performance problems.
Mapping	Allows you to specify the audio output device (local/remote) and determine how key strokes and clipboard content are handled. The mapping of serial connections and local drives can be enabled for a session. You can make connected mass storage devices available to the user using the appropriate mapping: Select Enable , choose the drive letter and the device to be mapped.
Options	Determines the start application and the work directory for use during the session (how authentication errors are handled during the logon procedure). If, when connecting to the server, a terminal server gateway is to be used, you can configure the relevant settings here (No Gateway is pre-set).

8.2.1. Server / logon

If a session is created or edited, you can change the RDP session settings if they differ from the global settings:

1. Specify a server and, where appropriate, a start-up application for the terminal server session.
2. Configure the necessary logon information.

Otherwise, the terminal server logon window will be displayed for you to enter a user name and password. If the local logon is used (see above), this window is the thin client's logon window.

➤ The option for freely entering the server can also be enabled under **Server → Variable Server Connection for Local Logon**.

If the **Pass-Through Authentication** option is enabled, the session with the local logon data for the terminal user, e.g. from the domain logon, is used. However, this setting will be overridden by the **Local Logon** global parameter. You should therefore not use both options at the same time.

Microsoft RemoteApp

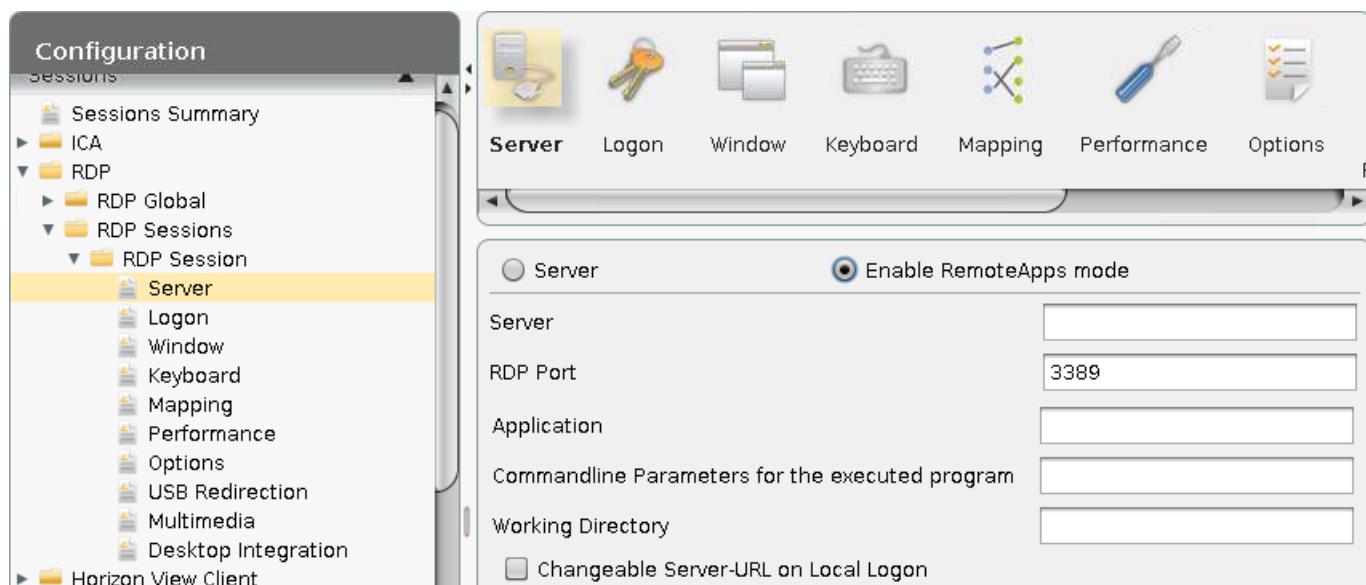


Figure 25: RemoteApp settings

Like the published applications of a Citrix server, MS Windows Server 2008 offers the option of passing on RemoteApps to the thin client. Detailed instructions regarding server configuration can also be found on the Microsoft website: [TS RemoteApp Step-by-Step Guide](#).

On the client side, only a few parameters need to be configured after enabling the RemoteApp mode.

Please note that the name of the application to be launched must be preceded by two vertical bars (||), e.g. ||Excel.

8.2.2. Display, keyboard and allocation of resources

- Under **Window**, specify the color depth, window size and the multiscreen behavior.
- Under **Keyboard**, configure the keyboard layout and the hotkey properties.
- Enable/disable the **allocation** of resources for the client, e.g. COM port or printer mapping.

The *global parameters* (page 51) are the default setting.

8.2.3. Performance and options

Specify the performance settings for the session if they differ from the *global configuration* (page 51).

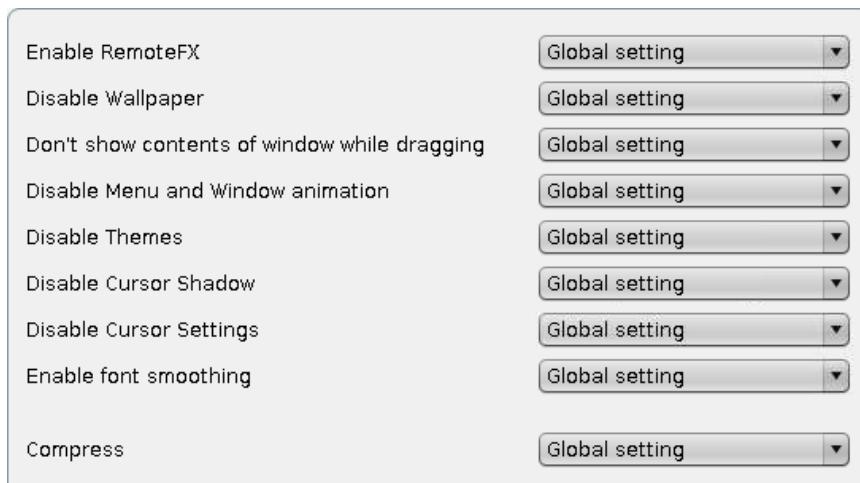


Figure 26: Performance settings

8.3. Web Access for Remote Desktop

With Web Access for Remote Desktop (Web Access for RD), users can access RemoteApps and remote desktop connections via a web browser. RemoteApps and remote desktop connections therefore provide a modified view of RemoteApp programs and virtual desktops for users.

More information on Web Access for Remote Desktop can be found under Microsoft Technet - Web Access for RD

The applications can be provided in the Application Launcher, in the Start menu, in the quick launch bar or on the desktop. A selection can be made from the list of available applications for display on the desktop or in the quick launch bar (**Look**).

For the purposes of logging in, normal user authentication as well as the **Kerberos-Pass-Through** mode are available.

8.4. SSH Session

This section describes the procedure for configuring an SSH session.

Use the SSH session to launch a remote application on the host via SSH (Secure Shell) and display it on the terminal. SSH allows secure, encrypted communication between two hosts or host and terminal via an unsecured network. X11 connections can also be routed via this secure channel.

Command	All necessary entries for creating an executable command to remotely launch the application via SSH
User name (remote)	Name of the remote user - The selected user must have a user account on the remote host.
Computer (remote)	Name or IP address of the remote host from which the remote application is launched.
Command line	Allows you to enter the name of the application program which is to be launched.
Options	
Forward X11 connection	X11 connections are automatically forwarded to the remote computer so that each X11 program launched from the shell or the command passes through the encrypted SSH channel. The authentication data are also defined automatically. This option is enabled by default.
Enable compression	Reduces the amount of data transmitted via the data channel - This option is disabled by default.
Get protocol version	You must prove your identity to the remote host using one of the various identification methods. These depend on the protocol version used. In this area, you can obtain details of the protocol version after opting for a particular identification method.

You will find detailed information on SSH and the various authentication methods on the relevant pages of the manual for your server operating system.

8.5. Firefox Browser

In order to allow central configuration via the IGEL UMS, the original configuration parameters for the Firefox web browser are assigned to the IGEL setup. These global settings can be changed for each browser session.

8.5.1. Firefox Browser Session

The original Firefox parameters are pre-set under **Settings**. The standard settings are carried over from the **Browser Global** setup.

The following settings for the browser session can also be configured:

Window	Allows you to specify the full-screen mode and multi-monitor options as well as the Firefox language / prevent users making changes to the browser / hide the configuration page (about:config) and the printer dialog
Symbol bars and toolbar	Allows you to hide/show toolbar items or complete toolbars in a session / configure a kiosk mode (browser in full-screen mode, restricted access to toolbars and autostart/restart configuration)
Hotkeys	Allows you to enable/disable hotkeys used in the Firefox browser.
Context menu	Allows you to enable/disable items in the browser context menu.

8.5.2. Browser Plug-ins

Various plug-ins such as a PDF viewer, Adobe Flash Player or Red Hat Spice are available. However, they may need to be licensed by the user first. Integration of the SecMacer security solution Net iD can also be configured here.

Flash Player

Before you can download and install Adobe Flash Player, you need to confirm that the software is licensed - IGEL Universal Desktop Linux does not contain a license to use the Flash Player.

The external link for downloading the Flash Player is up to date at the time of release of this software. However, it may change over time.

In addition to the official download source, you can specify your own source in the company network or the pre-configured firmware update source.

If the Flash Player fails to download via the external link, check the current path and file name in the browser as these may have changed in the meantime.

8.6. Media Player

Set up the Media Player for your multimedia applications here.

The following codecs are licensed via either the Fluendo Codec Pack or the MPEG LA Advanced Feature Pack:

Supported formats:	Supported codecs:
AVI	MP3
MPEG	WMA stereo
ASF (restricted under Linux)	WMV 7/8/9
WMA	MPEG 1/2
WMV (restricted under Linux)	MPEG4
MP3	H.264
OGG	

AC3 is not licensed.

8.6.1. Media Player Global

➤ Configure universal settings which will apply by default during all Media Player sessions.

If need be, the settings can be changed in the individual sessions.

Window

➤ Under **Image Aspect Ratio**, specify the required aspect ratio for video playback.

You can also choose the following options:

- Full-screen mode
- Automatically change window size as soon as a new video is loaded
- Main window should remain in the foreground
- Show operating components

Playback

➤ Specify how you would like to play back media files:

Endless loop

Automatically plays back a play list endlessly until you stop it.

Random mode Plays back the files in a play list in a random order.

- If you wish, choose the visual effects to be used during audio playback.

Visualization type Determines the visualization plug-in.

Visualization size Determines the visualization size.

Video

Video output	GConf:	System-wide configuration
	Auto:	Automatically selects the output
	XVideo:	Hardware-accelerated, uses shared memory to write images to the graphics card memory
	X11:	Not hardware-accelerated, playback via the X Window System display protocol

- Specify the brightness, saturation, contrast and color settings for videos.

Audio

Audio output	GConf:	System-wide configuration
	Auto:	Automatically selects the output
	ALSA:	Direct output via kernel driver for sound cards
Audio output type	Select Stereo if you are working with an IGEL thin client.	

Options

- Specify whether you would like to disable the **screen saver** during audio playback.
- Specify the **network connection speed** in order to influence media file playback.
- Specify the necessary **buffer size** for your network in order to ensure smooth audio and video playback.
- Specify whether you would like to **automatically load subtitles** as soon as a video begins. Currently, the **coding** for subtitles is always UTF-8.
- Specify the **font** and **text size** for the subtitles.

Browser Plug-in

If you would like to use the Media Player as a **browser plug-in**, you can change the configuration values here.

This will affect manually configured Media Player sessions.

8.6.2. Media Player Sessions

You can set up your own personal Media Player sessions here.

1. Click on **Add** to create a new session.
2. Specify a **session name**.
3. Specify which **possible ways of launching the session** you would like. You may choose a number of options here.
4. You may like to select the option of using **hotkeys** and define them.
5. You can also specify whether **autostart** (following a system start) and/or **restart** (after a connection is established) are to be used.
6. For the autostart option, you can also specify by how many seconds the session start is to be delayed.

As soon as you have set up a Media Player session of your own, it will appear in the structure tree under the **Media Player Sessions** directory. Your own session in turn contains three folders: **Playback**, **Options** and **Desktop Integration**.

Playback

➤ Under **Medium / File**, give the path of the file which is to be played back when the session is launched. Use the following formats:

/directory/filename
or
http://servername/filename.

For the window settings, you can choose whether you would like to carry over the global settings or use your own settings for this special session.

Options

If necessary, you can change the pre-configured settings for the operating components here.

8.7. Java Web Start Session

In order to be able to access Java web applications, you must enter the address of the necessary JNLP file. For example, this may be an IGEL UMS console which can also be run as a Java Web Start application.

8.8. VoIP client

This section describes the procedure for setting up voice-over IP telephony (VoIP). The IGEL Universal Desktop Linux firmware includes the Ekiga voice-over IP client (<http://ekiga.org>). This client allows you to use the SIP (Session Initiation Protocol) and H.323. In addition to the local contact list, the telephone book can also search the LDAP address books. You will find a detailed description of all Ekiga options under <http://wiki.ekiga.org/index.php/Documentation>.

8.9. VNC Viewer

Create a **VNC Viewer session** in order to be able to access remote computers (VNC server) via the thin client. Connection options such as the server address or the full-screen mode can be pre-populated for each session or defined individually when the system starts.

If a server address is specified for the session, the connection dialog will not appear when the session starts – the connection will be established immediately.

9. Accessories

Information on other accessories provided by the Universal Desktop can be found here.

9.1. ICA Connection Center

The Citrix ICA Connection Center provides an overview of existing connections to Citrix servers. It also allows the server connection to be terminated/canceled and the connection properties to be displayed, e.g. for support purposes.

9.2. Local Terminal

With a terminal session, you can execute local commands via a shell. In this case, the shell is similar to the Windows DOS command prompt.

It is also possible to access a local shell without a terminal session: You can switch to the virtual terminals tty11 and tty12 by pressing **Ctrl+Alt+F11** / **Ctrl+Alt+F12**.

9.3. Change Smartcard Password

Set up a session in order to change your IGEL smartcard password. Details of the setup procedure for your IGEL smartcard can be found under **Security** → **Login** → **Smartcard**.

9.4. Smartcard Personalization

Configure the options to start the Smart Card Personalization (page 83).

9.5. Setup Session

Specific areas of the setup can be made available to the user, even if the overall setup can only be accessed by the administrator. This is useful for example for keyboard and mouse settings or for screen configuration.

9.6. Quick Settings Session

Specific areas of the setup can be made available to the user, even if the overall setup can only be accessed by the administrator. This is useful for example for keyboard and mouse settings or for screen configuration. See *Quick Setup* (page 21).

9.7. Application Launcher

- Show the Setup and Application Launcher on the local desktop or in the start menu, or define hotkeys and the autostart option.

You can hide various items, e.g. buttons for shutting down or restarting the device, from the user.

9.8. Sound Control

Use the sound control to adjust the output volume and the input level as well as the balance between the input and output.



Figure 27: Sound control

9.9. System Log Viewer

All available system logs are updated and displayed. You can add your own log files in the options. The contents of the selected log can be searched in the viewer and also copied (e.g. for support purposes).

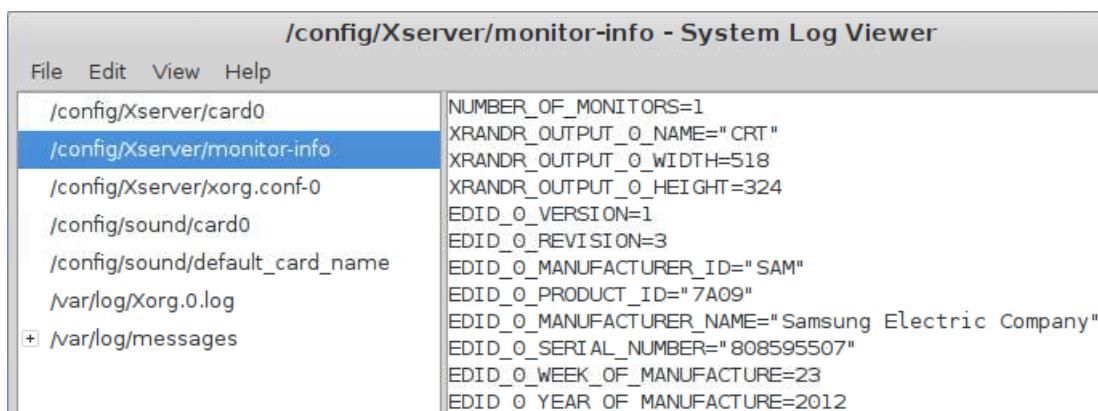


Figure 28: System logs

9.10. UMS Registration

Registration of the thin client in the IGEL Universal Management Suite can also be performed locally. To do this, enter the server address (with port) and the necessary access data. Directories already on the server can be selected directly.

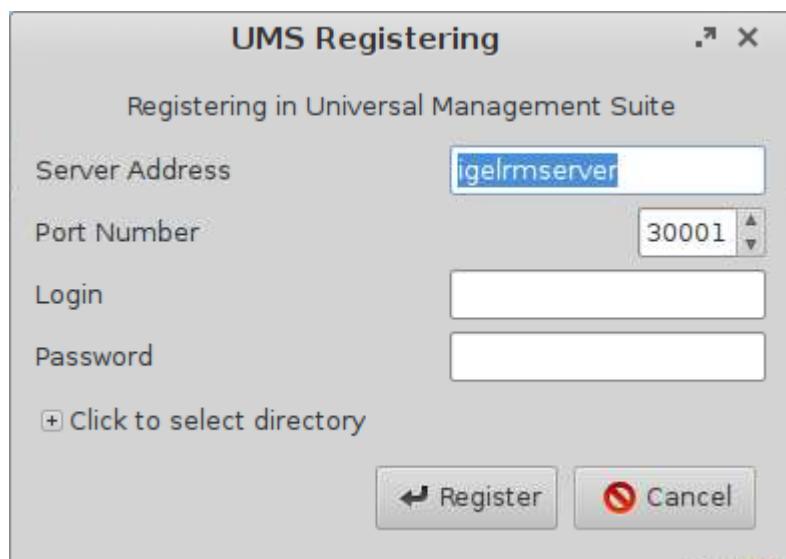


Figure 29: Register thin client on the UMS Server

9.11. Touchscreen Calibration

After launching the calibration program, you will see a pattern with calibration points which must be touched one after another.

9.12. Soft Keyboard (On–screen Keyboard)

Enable the soft keyboard (on-screen keyboard) for use with a touchscreen, e.g. IGEL UD9.

9.13. Java Control Panel

The Java Control Panel is an operating console which is used for various purposes.

- Specify how Java runs on your computer on the basis of various parameters.
- Manage temporary files used for the Java plug-in.

By doing this, you allow your web browser to use Sun Java to run applets and Java Web Start. As a result, you can launch Java applications via the network.

- Check certificates via the operating console. This gives you the security you need to use applets and applications via the network.
- Define runtime parameters for applets executed with Java plug-in and applications run with Java Web Start.

Further information can be found at

<http://java.sun.com/j2se/1.5.0/docs/guide/deployment/deployment-guide/jcp.html>.

9.14. Calibration Pattern

When calibrating your monitor (auto adjust), please use this special pattern. Generally speaking, you will achieve better results than if you calibrate the monitor with a conventional desktop and windows. Clicking on the pattern with the mouse closes the application again.

9.15. Commands

The following system commands can be made accessible to the user:

- Log off
- Sort symbols
- Switch off terminal
- Restart terminal
- Restart window manager

9.16. Network Diagnostics

The IGEL Universal Desktop Linux firmware features a number of tools for network analysis. These include:

- *Device information* (page 71)
- *Ping* (page 71)
- *Netstat* (page 72)
- *Traceroute* (page 72)
- *Look-up* (page 72)

9.16.1. Device Information

This tool provides information regarding the status of the network device used. This includes:

- MAC and IP address
- Link speed
- Various interface statistics (bytes transferred, errors etc.)

9.16.2. Ping

The **Ping** tool allows you to send contact queries to a network address. You can specify the exact number of queries to be sent. Alternatively, you can enable **Unlimited Requests** which means that the echo requests will be sent until you stop the process.

The Ping result is shown below, and the Ping duration of the last five Pings is illustrated in a bar chart.

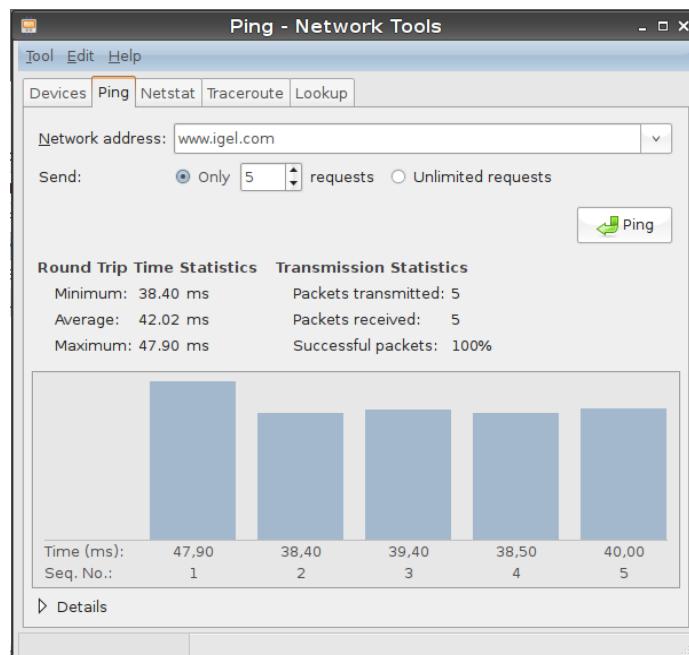


Figure 30: Ping network tools

- **Enable Program → Signal Tone for Ping** to configure the thin client to output an audible signal each time a Ping is sent.

9.16.3. Netstat

Netstat provides information on active network services with protocol and port information as well as a routing table and multicast information for your network devices.

9.16.4. Traceroute

With **Traceroute**, you can trace the route to a network address.

9.16.5. Look-up

The **Look-up** tool shows various information regarding your network address. The available information types are shown in this screenshot.

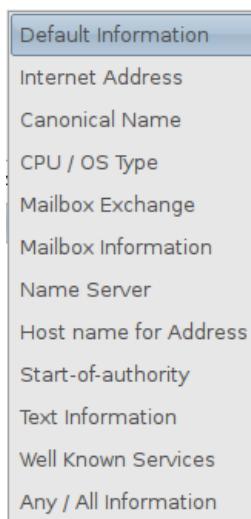
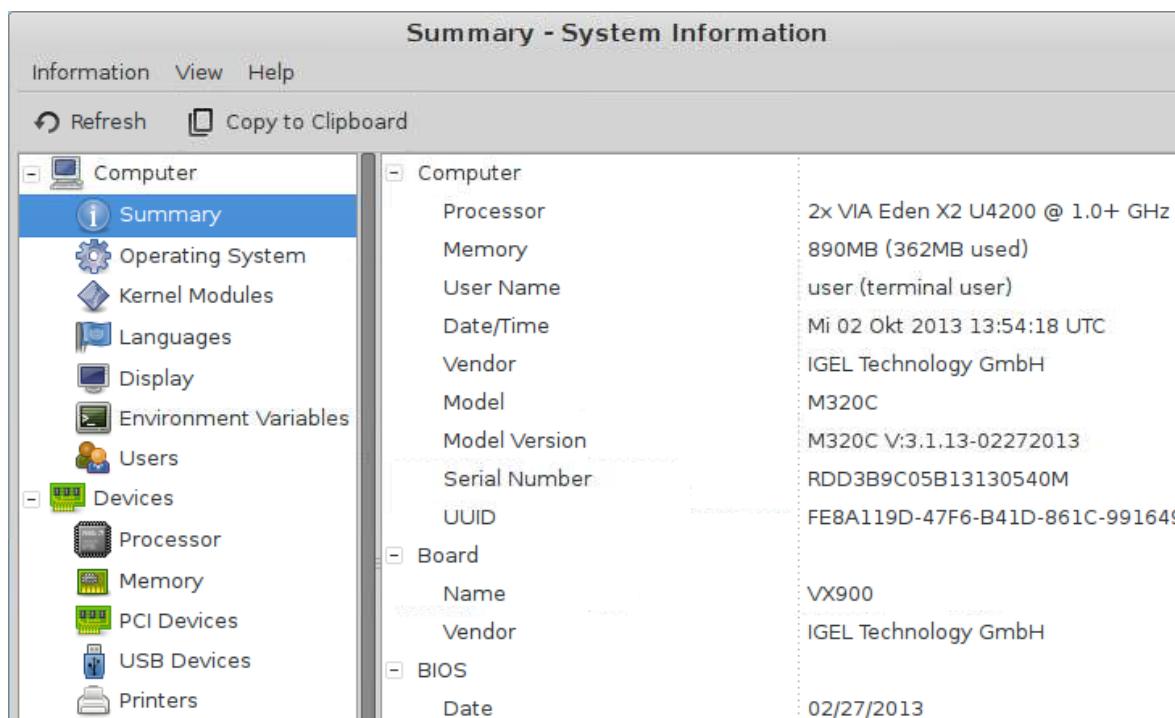


Figure 31: Information types for network address

9.17. System Information

The system information provides an overview of all internal and connected thin client hardware components as well as the constituent parts of the Linux system (e.g. kernel modules). The information shown can be copied to the clipboard in order to send it to the IGEL Support department for example.



The screenshot shows a software interface titled 'Summary - System Information'. The left pane is a tree view of system components:

- Computer
 - Summary (selected)
 - Operating System
 - Kernel Modules
 - Languages
 - Display
 - Environment Variables
 - Users
- Devices
 - Processor
 - Memory
 - PCI Devices
 - USB Devices
 - Printers

The right pane displays detailed system information for the selected 'Summary' node:

Computer	
Processor	2x VIA Eden X2 U4200 @ 1.0+ GHz
Memory	890MB (362MB used)
User Name	user (terminal user)
Date/Time	Mi 02 Okt 2013 13:54:18 UTC
Vendor	IGEL Technology GmbH
Model	M320C
Model Version	M320C V:3.1.13-02272013
Serial Number	RDD3B9C05B13130540M
UUID	FE8A119D-47F6-B41D-861C-991649
Board	
Name	VX900
Vendor	IGEL Technology GmbH
BIOS	
Date	02/27/2013

Figure 32: System information

9.18. Drive Management

Drive management shows all recognized USB drives along with their respective properties (device name, mount point etc.).

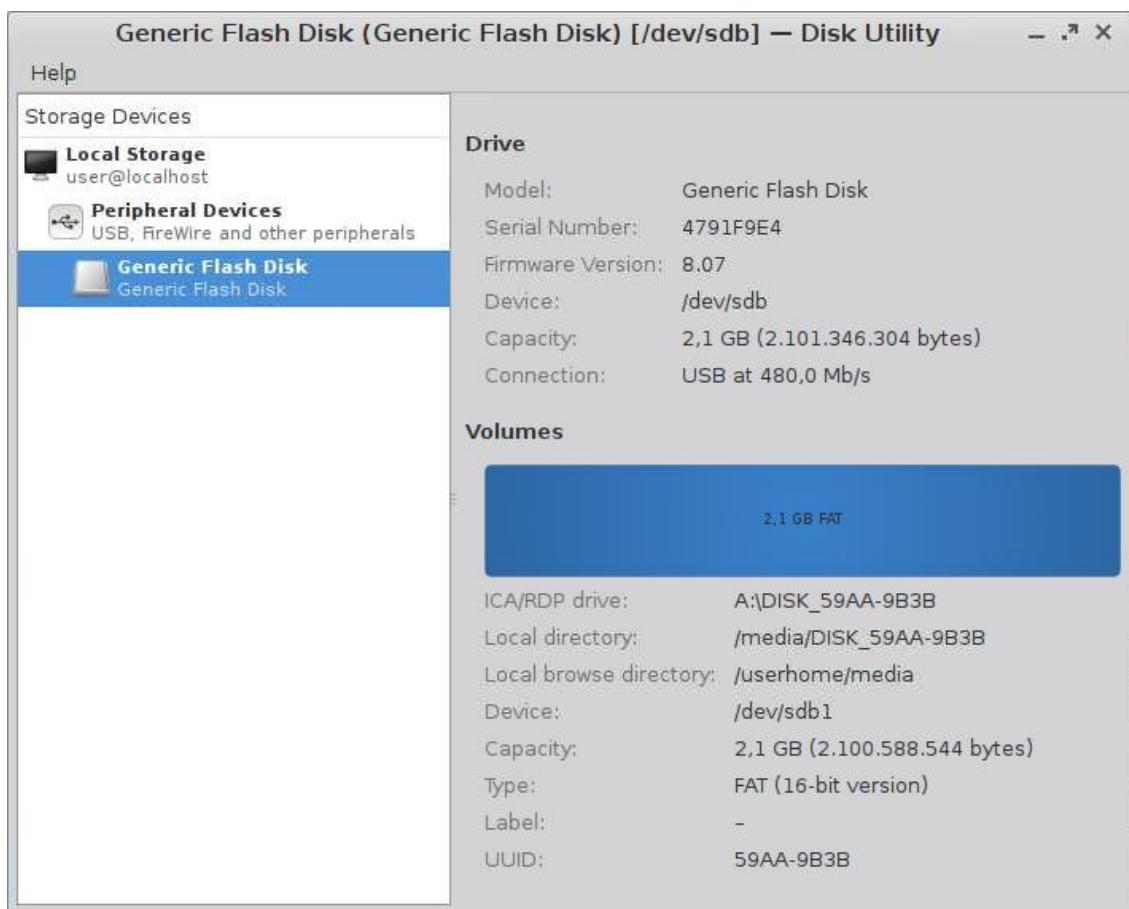


Figure 33: Drive management

9.19. Firmware Update

This session updates the firmware with the settings saved in **System → Update → Firmware Update**.

9.20. Identify Monitors

Shows the screen number from the IGEL setup and hardware information on every connected screen.



Figure 34: Identify screens

9.21. Upgrade License

You can distribute additional firmware functions via the IGEL Universal Management Suite or import licenses locally to a thin client. To do this, an IGEL USB stick with a smartcard or a storage medium containing licenses that have already been produced for this device must be inserted.



Figure 35: Firmware license upgrade

10. Devices

- Click on **Hardware Information** for an overview of your IGEL thin client device.

10.1. Printers

Various printing systems can be used with the thin client.

10.1.1. CUPS - Common UNIX Printing System

The Common UNIX Printing System™ (or CUPS) is the software which allows you to print from within applications, e.g. from this web browser.

CUPS converts the page descriptions produced by the application, e.g. "Insert Paragraph", "Draw Line" etc., into data which can be read by the printer, and then sends this information to the printer.

With the appropriate configuration, CUPS can use printing devices via the following connections:

- Parallel (LPT 1, LPT 2)
- Serial (COM1, COM2, USB COM1, USB COM2 – with USB serial adapter)
- USB (1st and 2nd USB printer)
- Network (TCP/IP, LPD, IPP)

Printers

Printers can be created and edited here.

- In the edit dialog, specify a printer name which begins with a letter.
- Under **Printer Connection**, select the interface type for locally connected printers or the network protocol for network printers.
- Enter the relevant configuration data for the interface or network printer.
- Select the local printer driver under **Manufacturer and Printer Name**.

Mapping in sessions

Map printer in NX sessions: Makes the printer available in NX sessions.

Map printer in ICA sessions: Makes the printer available in ICA sessions.

Map printer in RDP sessions: Makes the printer available in RDP sessions.

The remaining parameters are used to select the printer driver in ICA and RDP sessions on Windows servers.

- Give the name of the driver under Windows which is to be used.

If it does not feature in the list, it can be specified under **Use User-Defined Windows Driver Name**.

When printing in ICA and RDP sessions, the print data are normally prepared for the printer model by the Windows printer driver and are passed unchanged from the thin client to the printer. An exception is encountered when using the Windows driver in ICA sessions:

Manufacturer: Generic,

Model: Generic PostScript (Citrix Universal Printer Driver Postscript)

In this case, the print data are prepared on the thin client with the help of the printer driver defined above under Printers for the printer model. This requires thin client resources depending on the size of the print job.

IPP printer sharing

The IPP (Internet Printing Protocol) offers the following configuration options:

Network or host for sharing local printers	Allows printing on the local device from either the local or the global network.
Enable IPP printer browsing	Allows you to search for shared printers in the local or global network and show your shared printers within the network. A shared printer is visible within the network but it may not be possible to print from the network if you do not have the necessary authorization.

10.1.2. LPD - Line Printer Daemon

LPD printers are used by the BSD printing system and are also supported by Windows servers.

Enable LPD print server

Makes the thin client an LPD print server. The CUPS printers defined under 11.2.1.1 can be addressed under their printer name as a queue name via the LPD protocol.

Print data conversion

Attempts to automatically recognize whether or not the print data need to be prepared by the local printer driver. The **None** option always forwards the print data unchanged to the printer.

Max. simultaneous connections

Limits the number of print jobs that can be accepted at the same time.

Restrict LPD access

Specifies the sub-networks or hosts from which print jobs can be accepted.

10.1.3. TCP/IP

You can assign printers connected to your device to a TCP/IP port. The LPT1 (TCP/IP port 3003) is enabled by default. The printer can be connected to one of the following connections, provided that they are available on the device:

- Serial connection (COM 1 or COM 2)
- Parallel connection (LPT 1)
- USB (USBLP 1)
- Additional serial connections: USB adapter or Perle expansion card

Data are forwarded bidirectionally at serial interfaces. This means that other serial devices such as barcode scanners or scales can be operated too.

10.1.4. ThinPrint

ThinPrint allows the bandwidth provided for the transfer of print jobs to be reduced depending on the resources available. The ThinPrint client prints either on printers connected to a local interface (serial, parallel or USB), on an LPD network printer or on a CUPS printer defined on the thin client.

The following parameters can be found on the **ThinPrint** setup page:

Port number	Specify the port number via which the ThinPrint daemon is to communicate. Make sure that the port number on the ThinPrint client and the ThinPrint server is the same (communication will otherwise not be possible).
Bandwidth	Enter a bandwidth value (in bits per second) which is lower than or equal to the value specified on the ThinPrint server. A higher value, the disabling of client control or no entry at all means that the ThinPrint server values will be used.
Waiting time between print attempts	Maximum waiting time (in seconds) if a printer is unavailable
Number of print attempts	Number of attempts to contact a printer in order to start a print job.

The list of **ThinPrint** printers is shown on the **Printers** page.

➤ Here you can manage printer configurations by adding, editing or deleting printers.

The page provides an overview of pre-configured **ThinPrint** printers:

Active	Indicates whether or not the printer is visible.
Name of the printer	Name under which the printer can be addressed.
Printer class	Name of the printer class - optional, max. 7 characters without spaces
Device	The following options are available here: <ul style="list-style-type: none">• + /dev/ttyS0, /dev/ttyS1, ... serial interface• + /dev/lp0, /dev/lp1, ... parallel interface• + /dev/usbip0, /dev/usbip1, ... USB printer• + Name of a CUPS printer with LPD network printer connection: ThinPrint client prints via the network to the LPD network printer.• + Name of another CUPS printer: ThinPrint client forwards print jobs to the appropriate printer in the CUPS printing system.
Standard	Defines the selected device as the standard printer.

10.2. USB Storage Devices

USB storage devices can be configured here.

10.2.1. Storage Device Hotplug

➤ Specify how USB devices are set up here.

The most important details are

- the number of possible devices,
- the allocation of drive letters,
- the access type available to users in ICA sessions (read and/or write access).

Newly connected devices are automatically recognized by default. The terminal gives an audible signal and a pop-up window informing you that a new device has been found and will be started appears.

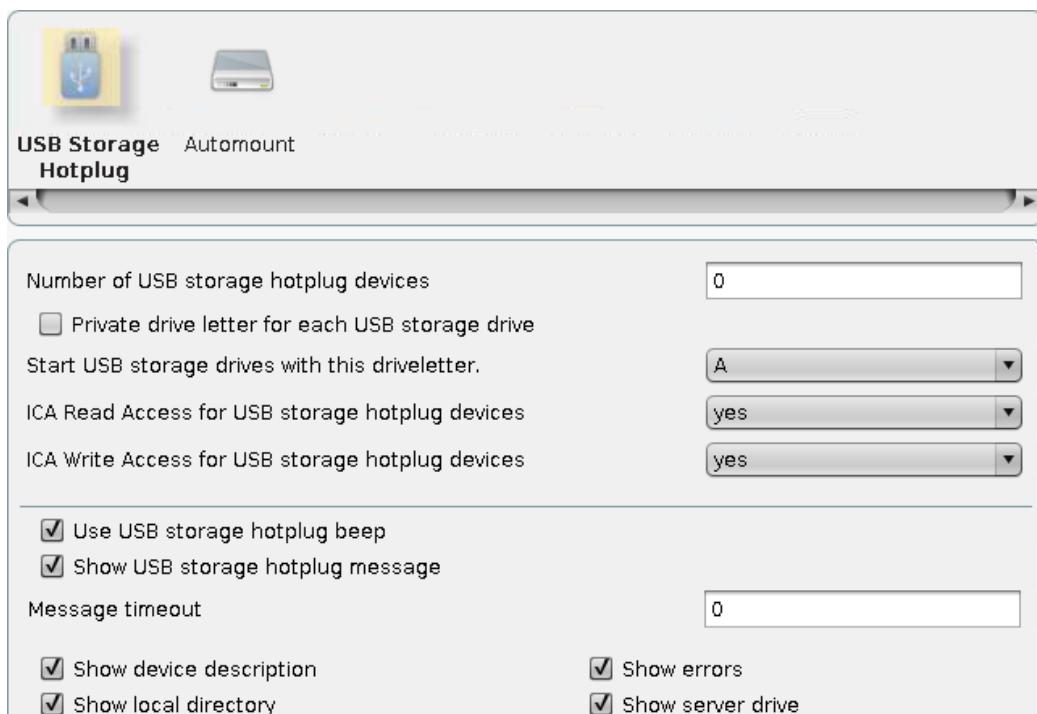


Figure 36: USB storage hotplug

10.2.2. Automount Devices

Here you can define the devices which are to be mounted automatically when accessed:

List of automount devices	Overview of the automount devices - The most commonly used devices such as the disk drive, CD-ROM etc. are pre-configured.
Edit	Opens and enables one of the pre-defined devices
Add	Manual configuration of devices not pre-defined in the automount device list .
Name	Name given to a device - This name is also used for the sub-directory created in <code>/autofs/</code> .
Device	Allows you to select a suitable device synonym - This can also be entered manually.
File system type	Definition of the file system - The <code>auto</code> option should normally be used. If, however, you use <code>ext2</code> or a problem occurs, you should clearly indicate the file system that you use.
Automount time-out	Regulates the time-out period - Specify in seconds how long the system should wait before the devices accessed are unmounted. The time period ranges from 0 to 600 seconds (10 minutes).

Do not set the time-out period to zero! This may result in data loss.

10.3. USB Access Control

USB devices can be permitted or prohibited for use on the thin client on the basis of rules. Sub-rules for specific devices or device classes are also possible.

1. Enable USB access control under **Devices → USB Access Control**.
2. Select a **set rule** (default behavior) which will either allow or prohibit the use of USB devices.
3. Expand the general rule by adding class rules and device rules where you specify the procedure for handling specific classes or devices.

Device classes can be for example entry devices, printers or mass storage devices, while device rules relate to the manufacturer, the product or the actual device (identified via its Universally Unique Identifier UUID).

Example:

- The set rule prohibits the use of USB devices on the thin client.
- However, the use of all Human Interface Devices (HID) is permitted.
- The USB storage device with the UUID 67FC-FDC6 is also permitted.

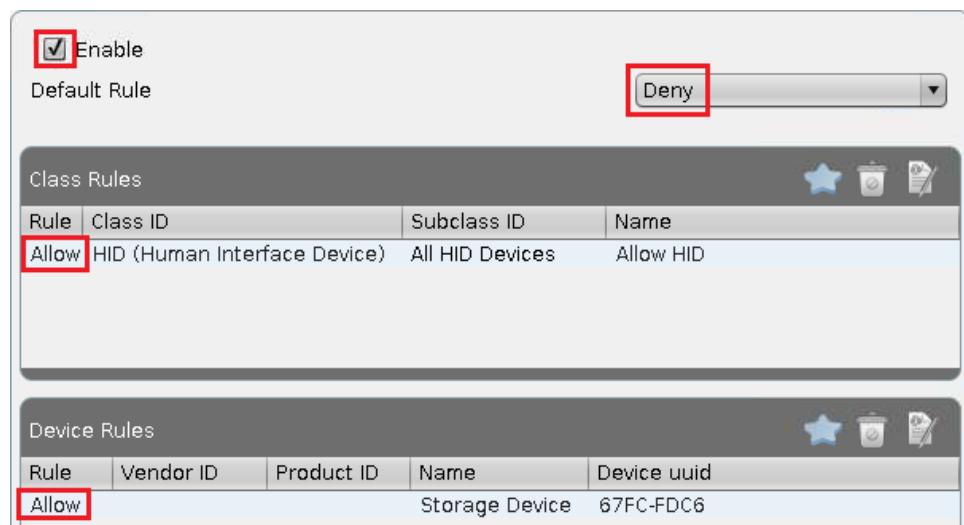


Figure 37: USB access control

Other USB storage devices, printers etc. cannot be used on the thin client with this setting.

10.4. PC/SC Interface

PC/SC is a service which makes smartcard readers and inserted smartcards available to application programs. RDP and ICA connections make it possible to provide server-side applications with client-side smartcard readers and smartcards. Local applications, e.g. browsers, can also use smartcards in the readers. For these functions to work, the PC/SC daemon must be enabled.

- Click on **Enable PC/SC Daemon** to use the PC/SC interface on the thin client.

The **PC/SC Devices Currently Active** window shows the smartcard readers which are currently available. Optional internal readers and a variety of USB smartcard readers are also supported.

11. Security

In order to prevent unauthorized access to the thin client setup which could allow deeper penetration into your network, it is essential that you set up an administrator password following the initial configuration.

- You can also use an additional user password which offers variable options for permitting restricted configuration by users.

11.1. Password

- Under **Password**, set up an administrator password and a user password.

Administrator and user password

Sets passwords for the administrator and user accounts. The setup will be protected by the administrator password unless the user has been granted access to specific areas.

By enabling this password, the IGEL setup, shell access to Xterm and access to the console will be restricted to the administrator. The **Reset to Factory Defaults** option may only be used with this password.

Remote user password

Sets a password for the remote session user (SSH).

Setup user

Allows the user to access the local setup.

When you enter a password, ensure that the correct keyboard layout is enabled. After all, you will only see stars instead of characters when entering the password and will not be able to see why the password was not accepted.

11.2. Logon Options

- Here you can configure the local login procedure for the thin client. You can login via the IGEL smartcard or via the Kerberos protocol, e.g. in a Windows domain.

11.2.1. IGEL Smartcard

Logging in with IGEL smartcard

Enables local login to the thin client with the IGEL smartcard. Sessions stored on the smartcard become available. The thin client is locked without the smartcard and optional password.

Enable IGEL smartcard without locking the desktop

Enables sessions stored on the smartcard after entering an optional password. The thin client is not locked – even without a smartcard.

Company key

Shared key for smartcards and thin clients. For details of smartcard personalization, see *IGEL smartcard* (page 83).

You can use the optional IGEL smartcard for local authentication and personalized session configuration ("Flying Doctor Scenario").



Figure 38: IGEL Smartcard

The procedure when using the IGEL smartcard with the internal card reader or an external reading device (USB) is as follows:

1. Enable the IGEL smartcard solution under **Security**→**Login**→**Smartcard** in the setup application.
2. Enter a **company key** to describe your IGEL smartcard.
3. Save your settings before you start personalizing the card.
4. In the **Personalization** window, you can set a login password and add sessions to the card.

Session configurations are stored on the card's IC (integrated circuit) and the session can be used on any IGEL thin client which reads the card.

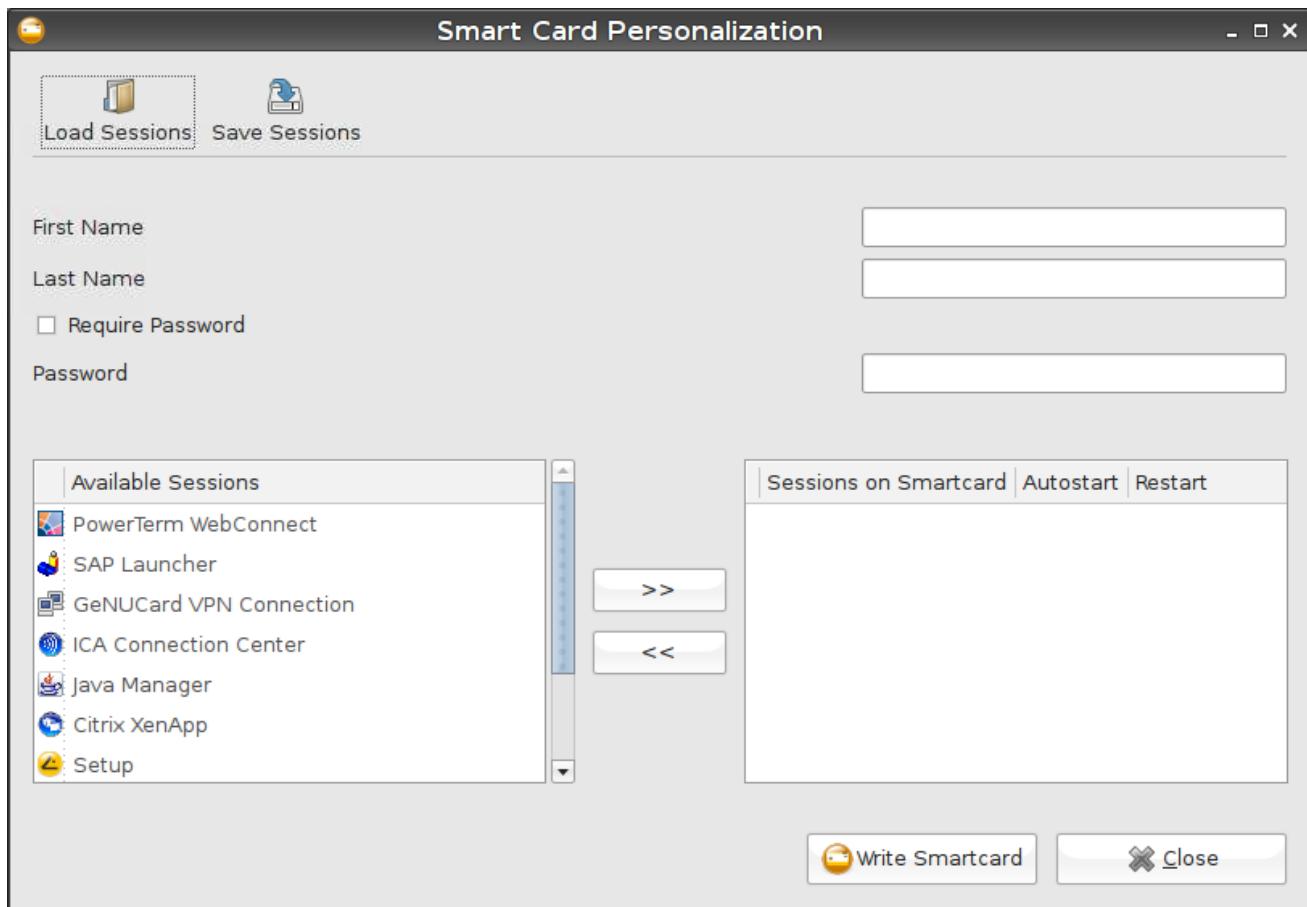


Figure 39: Smartcard personalization

Company Key

The IGEL smartcard solution also contains a **company key**. This is an additional code which is written to the card and which must match the code of the terminal used. If the two codes do not match, the smartcard cannot be used on that particular terminal. This additional security feature ensures that your terminals cannot be accessed from outside your company. It can also be used within the company in order to restrict employees' access to specific terminals.

Save User and Password

The procedure for saving users and passwords for authentication is as follows:

- Enter the first name and surname of the user.

You will then be prompted to enter the password for this name.

If the **Demand Password** option is enabled, a pop-up window will always open when a smartcard is inserted. If the wrong password is entered, access to the terminal will be denied.

If the smartcard is merely used to control access to the terminal, the procedure is as follows:

1. Insert a suitable smartcard.
2. Click on **Write to Card** in order to write the data to the card.
3. Remove the smartcard once the writing operation is complete.

You can now program the next smartcard.

Save Sessions

Saving sessions on the smartcard

If an employee uses a number of different terminals or the terminals are used by many different employees, it may be a good idea to save the sessions used by an employee on their smartcard instead of on the terminal. In this way, the user only needs to call up the applications they require in order to perform their duties.

The procedure for saving sessions on the smartcard is as follows:

1. Insert the employee's smartcard into the terminal.
The applications used by the employee are shown on the terminal.
2. Create the sessions you would like to add to the smartcard on the terminal (including an autostart option and personalization of login information).

In addition to the first name/surname of the card user and an optional password, you can also add to the smartcard the sessions shown in the **Available Sessions** area.

3. Once you have added all the required sessions, click on **Write to Card** in order to save the data on the smartcard.

Test Smartcard

- Test the card you have created.

After performing a warm start and inserting the smartcard, the sessions will be shown immediately on the desktop. Every session which is set to start automatically when you insert the smartcard will be launched.

11.2.2. AD/Kerberos

Logging in with Kerberos

Enables local login to the thin client via the Kerberos protocol. AD/Kerberos must also be *configured* (page 86) for this purpose. The login can be used for single sign-on in a number of session types (ICA, RDP).

Link for logging off

Allows you to configure the way(s) in which the user can log off.

11.2.3. Auto logout

Define an **Auto Logout** action which is carried out when you end the last instance of a session type:

1. Bring up the **Security** → **Login** → **Auto Logout** setup page.
2. Choose a **Session Type**.
3. Choose a **command (Auto Logout Command)**.
4. Save your settings by clicking on **Apply** or **OK**.

If the last session instance of the selected type is ended, the system will carry out the set action.

The **Shutdown** command carries out the set action. You can check this under **System** → **Energy** → **Shutdown**.

The **Logout** command has no effect if you have not defined a login method under **Security** → **Login** (smartcard, active directory/Kerberos or IGEL Shared Workplace). The **Logout** command cannot be used together with an appliance - in this case, only the **Shutdown/Suspend** and **Reboot** commands will work correctly.

If you use Auto Logout commands in an appliance, ensure that the appropriate session type was selected - e.g. Horizon View when using the VMware Horizon View Appliance.

11.3. AD/Kerberos Configuration

➤ Enable and configure Kerberos on these setup pages in order to use this service for login and single sign-on purposes.

Standard realm	Specifies the standard Kerberos realm for the client. Set this value so that it corresponds to your Kerberos realm (Windows domain).
DNS look-up KDC	Specifies whether DNS SRV records should be used to find key distribution centers (KDCs, domain controllers) and other servers for a realm if they are not indicated.
DNS look-up realm	Specifies whether DNS TXT records should be used to determine the Kerberos realm of a host.
No addresses	If this option is set, the first Kerberos ticket is addressless. This may be necessary if the client is located behind an NAT device (Network Address Translation).

11.3.1. Realm 1-4

Up to 4 realms where a login is possible can be configured here.

Realm	The name of the realm/the domains where you would like to authenticate yourself.
KDC list	IP or FQDN list of the key distribution centers (domain controllers) for this realm. An optional port number preceded by a colon can be attached to the host name.

11.3.2. Domain-Realm Mapping

Domain-realm mapping offers translation of a host name into the Kerberos realm name for the services provided by this host.

Standard domain-realm mapping	This should be enabled if the DNS and realm names match. Otherwise, you will need to create user-specific entries in the list.
DNS host or domain name	The entry can be a host name or a domain name. Domain names are indicated by a preceding dot. Host names and domain names should be entered in lower-case letters.
Realm	Kerberos realm name for this host or this domain

12. Firmware Customization

Configure the firmware to create your own personal workstation.

12.1. Custom Application

Applications which were loaded onto a customer partition for example can be launched via the **Application Launcher** or an icon on the desktop once they have been defined as own applications. In order for this to be possible, a command to call up the application must be entered under **Settings**.

12.2. Custom Commands

Custom commands can be mounted at various points in time during the system start.

Basic commands run once during the boot procedure.

The commands are executed at the following times:

Initialization	Not all drivers loaded, not all devices available Network scripts not started, network not available Partitions available except firefox profile, scim data, ncp data, custom partition
Session Early	Not all driver loaded, not all device available Network scripts started, network not available Partitions available except firefox profile, scim data, ncp data, custom partition Sessions not configured
Session Final	All drivers loaded, all devices available Network available Partitions available except custom partition System daemons not started (CUPS, ThinPrint etc.) UMS-configuration loaded but not effective
Final	All partitions available All system daemons started UMS-configuration effective

Network commands run each time the relevant interface starts (standard eth0). The interface can be defined by using the environment variable \$INTERFACE (eth0, eth1, wlan0).

The commands are executed at the following times:

Network Initialization	Network authentication successful (802.1x, WPA) No other network settings effective
Network DNS	Executed after change of IP address or hostname IP address / Nameserver settings effective (e.g. via DHCP)
Network Early	IP address / Nameserver settings effective (e.g. via DHCP) VPN connected if VPN autostart option is enabled Network / Host routing configuration not effective
Network Final	Network / Host routing configuration effective NFS and SMB mounts available System time synchronized with time server UMS-configuration loaded but not effective

Desktop commands run each time the X Server starts.

The commands are executed at the following times:

Desktop Initialization	Executed once during the boot procedure Desktop environment configured but not started User not logged in (Kerberos, Smartcard etc.)
Desktop Early	Executed once during the boot procedure Desktop environment started Message service started Session D-Bus started User not logged in (Kerberos, Smartcard etc.)
Desktop Final	Executed after login procedure or desktop restart User logged in (Kerberos, Smartcard etc.) User desktop started

Reconfiguration commands run when settings are changed via the local setup or the UMS. The commands are executed at the following times:

Reconfiguration	Executed after effective change of Thin Client configuration (local setup, UMS)
-----------------	---

12.3. Custom Bootsplash

See the description in the chapter *User Interface* (page 29).

12.4. Environment Variables

Environment variables allow you to use dynamic parameter content for a number of session types, e.g. so as not to have to enter ICA or RDP servers for every session. Within the IGEL Setup, the variables can be found under: **System → Firmware Configuration → Environment Variables**

Pre-defined variables can also be supplied and distributed via the IGEL UMS. Additional defined variables can only be used locally and may be overwritten by a UMS configuration.

The following session parameters can be configured through variables:

- ICA - User name (ICA sessions → [Session name] → Login)
- ICA - Citrix Server or Published Application (ICA sessions → [Session name] → Server)
- XenApp - User name (Citrix XenApp/Program Neighborhood → Login)
- RDP - User name (RDP sessions → [Session name] → Login)
- RDP - Server (RDP sessions → [Session name] → Server)

How to use environment variables

1. Enable environment variables under **Allow Variable Substitution in Sessions**.
2. Specify the variable name and content (e.g. Variable Name = SERVER NAME | Value = test server)
3. Enter the variable name in the session parameter field. The name is preceded by a \$ sign (e.g. \$SERVERNAME for the server for an RDP session)

In the case of RDP and ICA sessions, the setting is implemented after being saved and is entered into the session file. With XenApp, the setting is not implemented until a session starts and is running.

12.5. Features

Using this list of available services, you can quickly enable or disable firmware components such as Powerterm, Mplayer etc. If a service was disabled, the associated session type will no longer be available when the system is restarted. Existing sessions will not be shown but will not be deleted either. A disabled session type will not be updated during a firmware update. You should therefore disable unused services in order to speed up update processes.

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